35

Contents for May 1956

Report on the Bunker Silo.....Kansas Farmer 1
Feeding Hogs*.....Louisiana Extension 4
Cheaper Swine Rations.....The Farmer 5
Can You Afford To Mechanize Your Chores? Farm Management Report 8
New Dairy Heifer Factories.....Western Dairy Journal 11
Pigs Don't Need High Protein*.....University Farm News 13
New Uniform Ear-Tagging Plan for Cattle* West Virginia University 14
Corn on the Same Land, Every Year...Better Crops With Plant Food 15
Broilers Fed More Cheaply On Corn..Ohio Farm and Home Research 18
Good Woodland Management Profitable* Report from Dixon Springs 20
More Silage Will Mean Cheaper Beef.....Breeder's Gazette 21
A Young Man Can Buy A Farm.....Successful Farming 25
You Can Make Money On a Small Farm.....The Young Farmer 29
What We Know About Bloat.....Wisconsin Circular 446 35
New Technique in Corn Borer Control*.....University of Illinois 38
New Tilt-Up Farm Buildings.....Missouri Ruralist 39
Hybrid Lambs—Greater Vitality, Meat, Wool*...Wyoming Extension 40
How To Get Out of a Farm Fire Alive.....Farm Journal 41
Many Dairy Cows Are Liabilities*.....Purdue University 44
Prefabricated Plywood Loafing Barn.....The Country Guide 45
How To Produce Better Hatching Eggs..Everybodys Poultry Magazine 48
Getting More Food Value From Alfalfa.....California Farmer 51
Virginia's Beef Cattle Improvement Association..Virginia Angus Topics 53
Warning: Rats Perform Amazing Acts* Virginia Polytechnic Institute 58
New Southern Forage Crop.....Texas Livestock Journal 59
Tests Show Sows Need Roughage.....The Southern Planter 61
Ewes Need Grain and Roughage.....Farm, Ranch and Home News 62
Drainage You Can See.....The Rural New Yorker 63
Systematic Insecticide Controls Insects*....Texas A. & M. College 67
His Management Makes Most of Every Acre.....Farm Management 68
How To Use U.S.D.A. Crop Estimates.....The Kentucky Farmer 71
Ray Baxter's Cattle Feeding Program.....Nebraska Farmer 73
Behind That "New Look" In Fertilizers..New Jersey Farm and Garden 75
Cattle Numbers Continued Up in 1955*....Farmer's Outlook Letter 78
French Alfalfas Look Good.....New Jersey Agriculture 79
Alfalfa Weevil Invades the North East.....American Agriculturist 81
What Is Good Hay?.....Michigan Farmer 83
Tenants Hit By Farm Price Drop*.....University of Illinois 85
Grass and Legume Seedlings Can Be Saved.....Plant Food Review 86

*Short Features in This Issue. One Year Continuing Index, pages 94 & 95

THE FARMER'S DIGEST

FORT ATKINSON, WIS

FARMER'S DIGEST STAFF

Editor — L. Bush-Brown
Publisher — Hugh Highsmith
Office Manager — V. M. Binkert

ADVISORY EDITORIAL STAFF

William A. Albrecht, Chairman Department of Soils, U. of Mo.
Hugh H. Bennett, Ex-Officio, Soil Conservation Society of America
G. B. Gunlogson, Agricultural Advertising and Sales Promotion Expert
H. J. Reed, Dean of the School of Agriculture; Purdue University
T. J. Rutherford, Director, Veteran's Land Act, Ottawa, Canada
W. T. Spanton, Chief of United States Ag. Education Service

Published monthly, except June-July and August-September, when published bi-monthly at Fort Atkinson, Wisconsin, by Farmer's Digest Co.

1 Yr., $2.50, 2 Yrs., $4.50, 3 Yrs., $6.50
Canadian and Foreign Subscriptions, $3 for 1 Year, $5.50 for 2 Years, $8.00 for 3 Years

POSTMASTER: Return all undeliverable copies to Farmer's Digest, Fort Atkinson, Wis. Entered as second-class matter at the Post Office at Ambler, Pa., July 30, 1948, re-entered at Fort Atkinson, Wis., under the act of March 3, 1879.

"What I Think of Farmer's Digest—

I enclose six gift subscriptions. I tell these fellows . . . if I was able to give them $5,000.00, it would not do them as much good as this little book if they will read and heed." —New York State

the HIRED HAND that Never Gets Tired!

"Mow-All" the grass and weeds. Try Moz-All for the Best. Give your lawn a "treat". Trim fence rows, big yards, orchards, acreages. Zip through heavy weeds, dense brush. Solve the leaf problem without raking—burning. Get Going Today—See your Hardware or Implement Dealer—and have the Best Mowing you can get—or write to Box FD56

WIND KING ELECTRIC MFG CO., MERRILL IOWA

FARMER'S DIGEST SUMMER PUBLICATION DATES

During the summer months Farmer's Digest is printed and mailed to you every 45 to 50 days instead of monthly. This practice, started years ago, keeps our subscription rates down by giving you fewer copies during the months you have less time for reading. You will receive our June-July issue on or about June 15, our August-September issue on or about August 5. October and succeeding issues will again arrive near the first day of the publication month.

The Farmer's Digest

Volume 20 May 1956 Number 1

Report on the Bunker Silo

Valuable pointers on a new type of silo: What it is, where to locate it, costs of construction, labor required for feeding, etc.

Condensed from Kansas Farmer

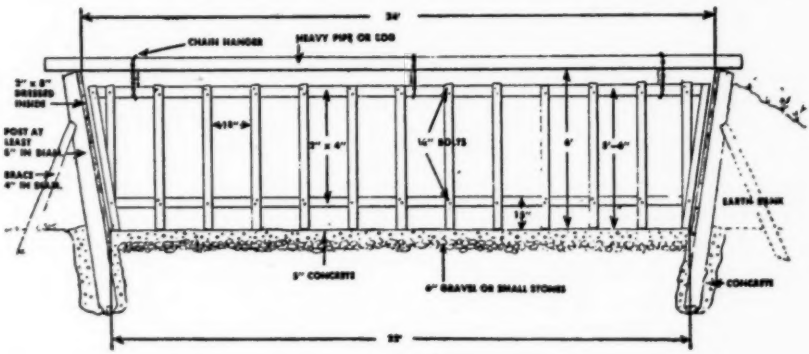
Dick Mann

WE ARE just coasting this winter, grins Dairyman Ben Foster, of Allen county, Kansas, who with his son Melvin, is enjoying the farm's first bunker-type, self-feeding silo.

The Fosters and 3 other dairymen we visited are finding these cheap silos just what the doctor ordered to cut costs and labor on the dairy farm.

What is a bunker silo? It's a trench silo built above ground. All of the men we talked to are

Below: Plan for bunker silo showing construction of a feeding gate.



Reprinted by permission from Kansas Farmer, Topeka, Kansas

using the same materials. They start with a gravel or crushed rock base, covered with a 4-inch concrete floor. Pressure treated tongue and groove 2-inch siding is used with pressure treated 6-inch poles 10 feet long and 4 feet into the ground and 4 feet apart. Poles are set first and from one to 3 of the bottom sideboards are attached before the concrete floor is run.

Flooring, when set, then acts as reinforcing for the sides. All 4 men, however, used cables across under the concrete on at least half the posts to help prevent spreading at the base.

Where should the bunker silo be located? Get it as close as you can to where cows use it. Convenience to cows is a first consideration. Also, it needs to be where you can get in and out to fill. All bunker silos should be headed east and west because of prevailing winds.

Here, in brief, is a summary of costs and experiences of the 4 Kansas dairymen using bunker silos:

Forrest Stewart, Bourbon county (farm owned by D. R. Kuns, who paid for silo): Silo on this farm is 80 by 18 by 6 feet deep, holds 185 tons. Thirty-five head of mature cows and heifers have access to it.

Total silo cost was $1,097 for materials. This was broken down to $650 for posts, sideboards, and gravel; $433 for readymix concrete; $25 for feeding gate.

Last fall the silo was filled with corn. Says Mr. Stewart: "We used a field harvester and trucks with false endgates. It took 2 days to fill. We had a man on a tractor in the silo, a man to help with endgates, 2 truck drivers, one on a field chopper. We started at 9 a.m. and quit at 4:30 p.m. due to chores. Cost of filling was $1.50 a ton plus $15 a day for trucks. I spent 15 minutes a day for 3 days after filling to pack. Three days seems to be ideal to get best seal."

How about spoilage? "Less than 2 per cent," says Mr. Stewart.

What labor is required in feeding? "Every third day I pull in a little silage at the bottom. This takes 10 or 15 minutes. Every 24 days I haul out the manure, dirt or any other accumulation."

What kind of feeding gate is used? "I use a 10-opening manger-type gate mounted on triangular pipe skids at both ends so pressure of cows against gate keeps it in place. Top is anchored by chain to pipe across top of silo so cows can't pull gate over when backing out."

How much feeding time are you saving? "Before, I fed silage twice a day and it took 50 minutes a day."

Do you also feed hay? "Yes,

all the cows will clean up."

Is there more or less feeding waste than when silage is hand-fed? "Less. Cows get what they actually need. In hand-feeding you sometimes give them too much or not enough."

Are there any disadvantages to the bunker-type silo? "The only one I have found so far is you can't add silage crops during the season. I also have an upright and a trench silo, using the upright for beef cattle mostly. The upright can be used best for adding silage crops during the year."

Ben and Melvin Foster, Allen county, have a new bunker silo 80 by 18 by 6 feet. Total cost was $1,098. Fifty-one head of mature cattle and calves have access to it. The silo was filled last fall with sorgo and cane.

What was the filling cost? "We paid $190 to a custom operator for cutting the silage. We did our hauling and filling but paid $20 for some extra labor. We packed with a tractor and a homemade roller made by filling an 18-inch whistle with concrete. This worked so well in leveling and packing that we didn't have to fork. Four-wheel trailers with false endgates were used to fill. Packing was continued 3 days after filling. No water was used but should have been."

What kind of feeding gate do you use? "We use one pipe, insulated on both ends and charged with electricity from a 6-volt electric fence charger. The charged pipe is suspended from the top of the silo by chains and is raised or lowered so animals can feed over it or under it."

Any Danger to Cows?

Are there any dangers in using this type gate? "Only danger is in electricity going off. Cows then can break thru and cause spoilage. It takes a few days to train cattle to eat, but otherwise there is no trouble."

How often do you change position of pipe and where do you set it to start? "We start by setting pipe low so cows will eat at top of silage. Every other day the pipe is raised or lowered."

How much feeding time are you saving? We did have to haul ⅜-mile from a trench. In real bad weather we spent 3 or 4 hours a day getting and feeding silage. We save this time plus wear and tear on equipment and cost of its operation."

How often do you clean out the silo? "Every 3 weeks."

Harry Billau, Allen county, is using his bunk silo the second winter. It is 18 by 40 by 6 feet. Cost of silo was $545 with additional cost of $45 for earth ramp at back end. He is feeding 26 or 27 head of dairy stock.

Why the earth ramp? "So you can get the full 6-foot depth

of silage at that end," says Mr. Billau.

How About Filling Cost?

What was your filling cost? "I paid $1.50 a ton for cutting and exchanged labor with neighbors for all other help."

Is your silo an efficient self-feeder? "Yes, but it would be even more so if I had 36 head instead of 27. Recommendation is for 1 cow for each 6-inch width of silage. When you don't have the recommended number, cows tend to pull down more silage than they will clean up."

How have you met this problem? "By keeping the feeding gate a little farther back from the face of the silage, then forking down behind gate as cows need it."

Harold Stout, Anderson county, has a bunk silo 19 by 60 by 6 feet. His total cost was $725 for silo, plus $30 extra for earth ramp. Silo was filled with alfalfa silage. He is feeding only 21 head, fewer than recommended.

With ramp at one end, how did you fill? "We used a tractor and winch to pull silage off trailers just as for a trench silo.

Do you have any special comments as the result of your use of the bunker silo? "Yes, the self-feeding angle doesn't work so well if there is too much age spread in animals. For instance, if you have some young calves in with mature cows you can't set the feeding gate to fit both. If you set it for mature cows they will eat back the silage to a point where the younger animals can't reach it. Result is, calves don't get enough to eat."

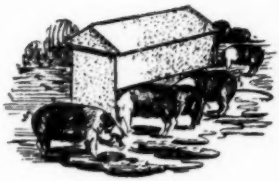
Above-ground self-feeding silos are so new they are attracting a lot of attention. Mr. Stewart says at least 150 persons have visited his farm to inspect the silo.

Bunker silos have not been fully tested in the area yet and some faults may show up later, but right now they look mighty promising.

Feeding Hogs

Twenty five years ago, the best pork producers needed 7 bushels of corn plus tankage and mineral, or a total of about 425 pounds of feed to produce 100 pounds of pork in the growing-fattening period. Thus, it required 786 pounds of feed to get a hog from 25 pounds up to 210 pounds. Furthermore, approximately 6½ to 8 months of feeding was needed to get the animal to market. The picture has changed considerably since 1930. Today, a progressive hog feeder can use just 5.2 bushels of corn and 52 lbs. commercial supplement to produce 100 pounds of pork. —*Louisiana Extension*

Cheaper Swine Rations



Five farmers push to 200 pound averages in 157 days, feeding 2.85 pounds per pound of gain and do it for 9½ cents per pound . . .

Condensed from The Farmer

James E. Sharon

THE 10c hog production barrier has been broken in spite of today's feed costs. Not in a single experiment under restricted conditions, but in farm feedlots and on a volume basis.

Five North Dakota farmers have produced 200-pound hogs for an average cost of only 9½ cents a pound in 157 days. There were 335 hogs on feed. Feed conversion hit a low mark of one pound of pork produced from each 2.85 pounds of feed.

Five more hogmen in the state, selected from the bottom end of a dozen producers, still fed out 300 head in 1955 for an average cost of 11½ cents a pound in 170 days. The hogs averaged 192 pounds, with a feed conversion of 3.53 pounds per pound of meat.

Run Costs Down to 8½c

At North Dakota Agricultural College, an even lower mark has been achieved. In a preliminary report on 10 lots of six pigs each, the best lot made gains costing only 8½ cents a pound. Researchers there already have ideas about a 7 cent figure.

Behind these new low cost figures is a feeding program that has grown in only a few years from nothing to an estimated 15,000 to 20,000 hogs fed on it in 1955, in North Dakota and Minnesota. Farther west, from Montana to Washington, the increase is at least as great.

Backbone of the program is pelleted barley. Ground and packed into a concentrated pellet along with other ingredients to make a complete feed, the barley releases a highly palatable protein ration at minimum cost. North Dakota Agricultural College put the program together.

Among the top five farmers producing pork in the 9½ cent range is Myron Stenseth, in Cass County. But for a minor veterinary expense, he came up with the lowest farm production figure yet—a fraction over 9 cents

Reprinted by permission from The Farmer, St. Paul, Minnesota

a pound. The first load of hogs he sold averaged 200 pounds, at exactly five months. He fed 101 head in all, saving some for gilts.

The last feeding period meant nearly 5 cents a pound extra to Mr. Stenseth, in addition to the margin normally expected. He sold the load at 16 cents a pound, ahead of the fall price drop.

Complete Feeding Program

The program isn't one of just barley alone, but of a balanced ration that starts with a healthy sow, sanitary quarters for the pigs and a ration geared to the pigs' needs all the way to market.

Often the program is made up of pellets all the way from birth to market; first with pig starter pellets until weaning at five to eight weeks, then grower pellets awhile, and finally the full pelleted barley ration. The pigs usually get 25 to 30 pounds of starter per head, about 50 of grower and then 400 to 450 of the pelleted finishing ration.

Homegrown grains also can be used in the program, however. Mr. Stenseth fed 79.2 pounds of oats, 27.7 of corn, and 79.2 of millet to each pig from birth to market in addition to the pelleted ration.

Starter pellets usually follow a formula similar to the recommendations of the agricultural colleges. In most cases they include ground yellow corn, oats, meat scraps, fish meal, soybean oil meal, dried molasses, vitamins, antibiotics, plus several other ingredients. Protein content is around 16%.

Grower pellets contain all the above ingredients, plus ground barley. Amounts of contents vary, with protein at 14%. The final fattening ration cuts out the corn, brings in blood meal in addition to the meat scraps, fish meal and soybean oil meal. Protein is at 13%. While fiber in the starter pellets is down to 3% for the little pigs, it is stepped up to 8% in the finishing formula.

USDA says that modern technology in agriculture enables consumers to spend only 25 cents of their wage dollar for food, leaving 75 cents for other essentials to modern living.

There is one point to consider in the records of these 10 farmers. All were made on spring pigs, with a favorable season ahead of them. Of the top five herds, two were on alfalfa pasture, two on native pasture, and one in drylot. All five of the lower group were on drylot.

But, the last of nearly 350 pellet-fed fall pigs have been marketed by two other North Dakota raisers.

Get Fast Gains

At Fargo, Fred Peterson and

his son, Dale, weren't slowed down a bit by the severe winter. They topped off 25 head at an average of 209 pounds at exactly five months of age. The first load brought nearly 13 cents a pound. All were on the pelleted ration with no homegrown grain. Feed costs haven't been figured yet, but there is a possibility they'll be around the 10 or 11 cent figure.

"We've shaved five weeks off the time it takes us to feed out pigs," says the Petersons. Along with their local feed supplier, they figured it costs nearly 8 cents a day for body maintenance alone on a hog being fed in winter. They saved about $2.80 per hog, or perhaps $450 on the 165 head, by cutting off the five weeks.

Roland Brandt of Amenia, N. D. is the other farmer to push fall pigs to market in five months this winter. He sorted and sold 50 head that averaged 233 pounds, on January 25. Actually, they were a week past five months, but the market top had climbed from a low of 10 cents to 14 cents during that time, so it paid him to hang on that long. He received the 14 cents top.

Although the number of farms in the U. S. selling milk is declining, total milk sales have reached a new record high as sales per farm rapidly increase, USDA reports.

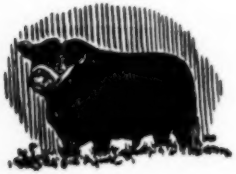
His remaining 130 head were farrowed later, but many were up to the 215-220-pound size the last week of the month. These were the first fall pigs he has fed out on the barley pellets. They each got 25 pounds of starter, about 40 of grower, 40 of shelled corn and perhaps 425 of finishing pellets, all on self-feeders in dry-lot. All the feed bills weren't in yet, but it looked as though Mr. Brandt had hit about the same production mark as the Petersons.

Have Crossbred Hogs

Another important factor used to advantage by a majority of these farmers is the vigor they get by crossbreeding. Mr. Brandt uses Chester White - Hampshire sows with a Yorkshire boar. He now is turning to a meat-type Duroc for more of that vigor. Petersons have a three-way cross of Chester Whites, Berkshires and Yorkshires.

Still another North Dakota hogman, John E. Anderson and his son, Arthur, produced pigs at just over 10 cents a pound, averaging 213 pounds at 152 days. Last fall they switched from pelleted barley to ground feed when the pigs weighed about 125 pounds, and feed costs were up a cent a pound.

Can You Afford To Mechanize Your Chores?



A facts and figures comparison of the costs of feeding 100 steers . . .

Condensed from an
Illinois Farm Management Report

Professor J. E. Wills

THE question, "Can you afford to mechanize your chores?," cannot be answered with a definite YES or NO. You can afford to mechanize *if* the reduced costs and added returns are greater than the added costs and reduced returns.

TABLE 1 — Comparison of Hand Methods and Mechanical Methods of Feeding 100 Steers

	A (Hand Method)	B (Mechanical Method)
Unloading Silo	**Labor** 45 hrs. 150 lb. per min. 15 min. per day **Equipment** $ 6 1 fork	**Labor** 12 hrs. Regular: 2 min. per day Irregular: 15 min. per week **Equipment** $225 15% of $1,500 **Electricity** $ 14 60 lbs. per min 111 hrs. x 5 HP
Feeding	**Labor** 190 hrs. 60 lb. per min. 65 min. per day **Equipment** $18 Baskets, fork	**Labor** 60 hrs. 200 lb. per min. 20 min. per day **Wagon** $ 90 10% of $1,800 1/2 used in cattle feeding **Tractor,** fuel only $ 30 60 hrs. 2 gal. per hr.

Reprinted from an Illinois Farm Management Report, University of Illinois, Department of Agricultural Economics, Urbana, Illinois

As an example, assume that a farmer is feeding 100 steers for 180 days in drylot. Feeds fed per steer include 2 tons corn silage, 40 bushels corn (ground ear), and 200 pounds of protein concentrate. In the present hand methods, silage is forked by hand from an upright silo; silage, corn and supplement are distributed to feed bunks in a basket. In the proposed mechanized method, a surface unloader is used in the silo; silage, corn, and supplement are distributed to feed bunks with a self-unloading wagon pulled by a tractor. No change is proposed in method of handling hay, or in grinding ear corn.

Table 1 summarizes the requirements of the two methods of handling feed. Rates used are based on a study reported in Illinois Circular 714. Table 2 summarizes the same information in a way that can be used to test the effect on net returns of any change in practice.

TABLE 2 — Effect of Mechanization on Net Returns, Feeding Silage and Concentrates to 100 Steers

1. Added costs	
Overhead cost of silo unloader	$225
Overhead cost of self-unloading wagon	90
Operating cost, electricity for silo unloader	14
Operating cost, fuel for tractor	30
Operating cost, labor, 72 hours	?
Total added costs	$359, plus 72 hrs.
2. Reduced costs	
Equipment	$ 24
Hired labor	0
Labor of regular worker, 235 hours	?
Total reduced costs	$24, plus 235 hrs.
3. Balance of costs and returns	
Reduction in labor	163 hrs.
Increase in equipment cost	$335

Chemical Kills Thistle

The Canada thistle, one of the most troublesome weed pests, may bow to a new chemical, amino triazole, report plant pathologists. Applied to thistle foliage in the bloom stage, or to thistle stubble, the weed-killer has given excellent control in preliminary trials by Oregon State College. The chemical also shows promise for controlling certain brushy plants and Russian knapweed.

Dairyman Says Artificial Breeding Is Ideal for Small Herds

Artificial breeding is custom tailored for the small dairy herd. So says Conrad Bath, Jr., who has a small herd of 12 milk cows on his 120-acre farm.

He thinks it's much cheaper to use artificial breeding than to keep his own bull. "With my size of herd," he says, "I couldn't possibly afford to buy the quality of bull that is available through artificial breeding. Besides that, I don't have to worry about feeding and taking care of a bull."

He began artificial breeding in 1950, and has had great success in getting his cows to settle on the first call by the technician. Of the 14 cows bred artificially during the first year, all but one settled on the first call. His success has continued, and the conception rate has averaged 90 per cent or better every year.

After entering the program, Bath said he noted a difference in the quality of his calves. "The artificially sired heifers showed a great improvement over heifers that I used to get," he notes.

Most of his artificially sired heifers are just coming into production. They won't be hitting their full stride for another year or so, but he thinks they will show a big improvement over their dams.

According to Bath's estimates, his herd averaged less than 300 pounds of butterfat and about 8200 pounds of milk in 1949, just before he entered the artificial breeding program. Now, with his dairy herd improvement program in full operation, his DHIA records show an average of 10,842 pounds of milk and 418 pounds of butterfat per cow. His average income, above feed costs, is now about $350 per cow.

He credits the artificial breeding program with increasing average production by 2600 pounds of milk and 118 pounds of fat per cow. In addition, his net annual income from the herd has been boosted by about $2,000.

He also points to another significant fact. The first seven artificially sired heifers to freshen made an average record of 10,937 pounds of milk and 437 pounds of butterfat—figured on a mature equivalent basis of 305-day records and two milkings a day. The records of these young heifers showed an average gain of almost 140 pounds of butterfat more than their dams. —*Colorado Extension*

Dairy Heifer Factories . . .

In some areas of the U. S., the farm or ranch devoted to raising dairy heifers may be the coming thing . . .

Condensed from Western Dairy Journal

AS THE world grows more and more specialized, each segment of industry must convert to meet public demands. In the dairy industry, one answer to this trend appears to be "heifer factories"—ranches where a dairy cow never is milked, but hundreds to thousands of dairy heifers are on the place at any time.

Several such enterprises exist in the near vicinity of the Los Angeles' milkshed.

South-easterly from Los Angeles there is an agricultural boom in California's Coachella Valley. Every day sees sagebrush and mesquite land being converted to fields of barley, alfalfa, cotton, corn or citrus orchards.

Here, where water has become plentiful and almost all controllable by man, the enterprising farmer is developing almost every possible crop.

To satisfy the growing demands of the Los Angeles dairymen, Coachella Valley farms are developing heifer factories. Among the hardy, seasoned date groves are springing up corrals which house dairy heifers.

Two years ago, Sydney Davis, general manager for Dunlap enterprises, and Bert Farmer, manager of Dunlap Ranches, became intrigued with the thought of starting a replacement heifer program in their 10-acre, 25-year-old date orchard.

Earlier, a few beef-fattening corrals had been constructed among the date trees. These became the start of the Dunlap heifer program. The Dunlap operation is designed around 100-pen heifer lots, calving and ready for the milkshed every month.

Culled and bought as 2-month-olds at about 200 lbs., the calves are brought to their desert home. Here they are sorted, penned, and put on a grain supplement.

Fed free-choice, along with

Reprinted by permission from Western Dairy Journal, Los Angeles, California

free-choice alfalfa hay, the concentrate ration is bought from a nearby feedlot. It generally is a 4% fat and 18% protein supplement balanced with meals for amino acids.

At 6 months of age, the calves are run through the chute where they are vaccinated, ear tagged, dehorned, tattooed, branded and have extra teats removed.

When they reach 450 lb., off the grain diet they go, and onto roughage. This is the ration for the rest of the program—silage and alfalfa, plus free-choice of minerals, salt and cotton waste (which has about 8% protein). In addition, molasses is sprayed by wagon on the hay once a day.

Silage is fed on an equal dry-parts basis with alfalfa. Last year they put up 2,500 tons of sweet corn silage. Because of a market collapse, they were able to buy some unharvested fields at $5 an acre. Actual cost of the sweet corn in the field worked out to 78c a ton.

Breeding is geared to size. When the heifers get to 850 lb., they are penned up with a Hereford bull for natural breeding. A Hereford is used so the heifer will have an easier job in dropping a smaller, first calf.

Bulls are changed, with one being in the pen for several months to insure all heifers are bred. So far, they have had only one hard breeder out of 1,800 head.

At 1,200 to 1,300 lb., the heifers move into the Los Angeles milkshed as close springers. Once in a while, timing is a little too close, and a white-faced calf goes alongside.

Bert Farmer pointed out that their records show an average gain of 1.6 lb. a day. For rough figuring, they consider 50 lb. a month as the rate of growth.

Except for repairs and maintenance which is done by other ranch hands but charged to the operation, the heifer factory is run by the foreman and one helper.

Culling goes on continually during the program. But because of careful screening before the calves are bought, necessary culling runs below what had been expected.

Health problems are almost absent. Pink eye seems to be the worst problem. However, each case is immediately isolated until cleared up.

There has been no record of heat prostration. In fact, Sydney Davis explained that only one case of heat prostration appears to have been found in the entire valley. Shade plus plenty salt in coarse granular form and 72 degree fresh well water seems to solve any heat problem.

Manure goes back into the light soil in the area, at the rate

of about 5 tons per acre, and along with bout 200 lb. of calcium nitrate per acre. This helps condition the soil.

Future plans at this "heifer factory" call for "custom-raising" of heifers along with its own heifer program. Under this plan, Davis remarked, heifer calves would be taken and raised to calving for a dairyman on a weight-in and weight-out basis.

Pigs Don't Need High Protein

Pigs fed 14 and 11 per cent protein rations produce just as good carcasses as those fed higher protein rations with from 15 to 18 per cent protein.

That's what University of Minnesota hog specialists L. E. Hanson and W. J. Aunan found in tests the past two years. Well balanced, properly fortified, lower level protein rations gave as lean a meat, as firm a carcass and as good a color as high protein rations.

They explain that added supplements such as vitamin B-12, antibiotics and some of the B-complex vitamins make it possible to step down protein levels and still keep pigs using feed efficiently and gaining.

They ran two experiments to see how a lower protein level affected carcass quality. One test involved Chester Whites, Durocs and Poland Chinas, the second used Minnesota No. 1 and Minnesota No. 2 crossbreds. They used two levels of protein in each, feeding the high level protein—18 per cent—from the start to 125 pounds, shifting down to 15 per cent from 125 pounds up to 200 pounds.

The low level protein ration was 14 per cent protein from the start to 125 pounds and 11 per cent protein from 125 pounds up to 200. At the start, the Minnesota crossbreds were about 10 weeks of age and averaged 60 pounds and the three breeds averaged 41 pounds and were eight weeks old.

At the end of the tests, there were no significant differences between the two protein levels in the pigs' carcass length, weight, average backfat thickness, dressing percentage and amounts of lean and fat tissue.

Nor was there any difference between the protein levels in lean tissue color or carcass firmness. In both experiments, with a total of 54 pigs, all carcasses gave cuts firm and bright enough to rate No. 1.

University Farm News

NEW UNIFORM EAR-TAGGING PLAN TO IDENTIFY CATTLE

Major advantages of the new nation-wide uniform plan for identifying dairy and beef cattle with only one eartag for each animal were listed by specialists of the Agricultural Extension Service, as follows:

1. No duplication of identification numbers.
2. Only one tag per animal.
3. No additional cost to individuals and groups.

"The essential feature of this new system is that a record of number assignments will be kept in each State," the specialists point out. "Official agencies and groups will continue to buy identification tags where they please, but they will first get a block assignment of numbers from the Federal or State official who will keep the 'book' of assignments within the State."

As central booking offices are established at State initiative, the U.S. Department of Agriculture, which is pioneering the plan, anticipates that the new system of uniform numbering will be quickly and widely adopted.

The complete series of eartag numbers in a single State will run, for example, from 35-AAA0001 through 35-ZZZ9999. (The number "35" is the State code for Wisconsin.) This will provide a block of 169,000,000 different numbers for each State, sufficient for all the different agricultural groups concerned with dairy-herd improvement, artificial breeding, and disease eradication. Within the full block of numbers, for instance, one group in a State might wish to "book" for its use the X series, providing 6,760,000 different numbers. One section of this group might then be allocated the XA sequence of numbers, while another takes the XB sequence. The backs of the tags may carry the name or initials of the purchasing group.

USDA animal disease eradication workers report that one of the chief difficulties in tracing cases of bovine tuberculosis back to their point of origin is the lack of adequate identification of animals sent to market. In some cases, an animal recently killed has been found to have the same tag number as that carried by an animal still living. The USDA's Agricultural Research Service is now contracting for ear tags conforming with the nation-wide uniform plan to use in identifying animals in the brucellosis and tuberculosis eradication programs. *West Virginia University*

Corn on the Same Land, Every Year

Illinois tests show continuous corn is a possibility with good management. Here are 23 years of test results.

Condensed from Better Crops with Plant Food

H. J. Snider

SINCE the beginning of farming on this continent, farmers have tried to grow corn on the same land year after year. A few have been successful, many have failed because of a decline in fertility, loss of soil tilth, the removal of topsoil by erosion, and the accumulation of insects and diseases. Growing corn every year on the same land does offer considerable advantages, but results in past years have been so disastrous that continuous corn has been rather vigorously discouraged. The practice now begins to show some interesting results as we obtain a better understanding of the value of soil tilth and erosion control, improvement in crop fertilization, along with new ideas in planting corn and the use of adapted hybrids.

In the course of general farming when corn is grown too frequently on land, there may eventually be a decided slump in yield. On the University South Farm at Urbana, Illinois, in a rotation of corn, corn, oats, clover, the corn averaged 106 bu. an acre through the rotation; that is, first year corn 106 bu., second year 106 bu., oats 62 bu., and clover hay 3 tons an acre.

An additional corn crop in this rotation, such as corn, corn, corn, soybeans, gave corn yields as follows: first year corn 90 bu., second year 79 bu., third year 67 bu., and soybeans 36 bu. an acre. With the additional corn in the rotation and the elimination of the clover crop, the corn yields began to slant downward at an alarming rate.

This drop from 90 bu. down to 67 bu. an acre served to discourage the use of such a rotation even under central Illinois soil

Reprinted by permission from Better Crops with Plant Food, Washington, D. C.

conditions. The land in each of these rotations was limed and given a heavy application of manure ahead of the first corn crop. With two corn crops and clover in the rotation, the corn yields were maintained at a 106 bu. level. When a third crop of corn replaced the oats crop and soybeans were the only legume, the corn yields went down to 67 bu.

In an Illinois field test which included the more modern aspects of continuous corn fertilization, the yields were maintained at an average of 76 bu. an acre over a span of 23 years. The following results were obtained on the Dixon experiment field located in Lee County in northern Illinois. The soil type is largely Muscatine silt loam. The first 10 years, with no fertilizers, corn averaged 63 bu. as compared to 55 bu. for the last 10 years of the 23-year period. When a starter fertilizer was used each year, 300 lbs. of 3-12-12, the corn for the first 10 years averaged 70 bu. and the last 10 years dropped to 60 bu. an acre. With nitrogen as 120 lbs. of N. or 600 lbs. of ammonium sulphate was used in addition to the starter fertilizer, the yields averaged 71 bu. the first 10 years and 65 bu. an acre the last 10 years. The pay-off came when in addition to the nitrogen and starter fertilizer there were added each year 80 lbs. of P_2O_5 in the form of superphosphate and the equivalent of 100 lbs. of K_2O as muriate of potash. This fertilizer treatment maintained an average of 76 bu. of corn throughout the 23 years of operation of the test.

Results of these field tests indicate that growing corn continuously for a long period of years is feasible and that the yields may be maintained at a high level of production. There is a probability that the amounts of fertilizer to be added each year may be adjusted by precision soil testing so that the enterprise will be profitable from the farm standpoint.

The average dairy cow will consume from 2½ to 3 tons of top-quality hay in the winter feeding season.

The old Morrow Plots at Urbana have given a 25-bu. longtime average for corn grown continuously on the same land without soil treatment. This low yield is compared to a 56-bu. average obtained in a corn, oats, clover rotation also without other soil treatment. Based on these facts and under this system of operation, continuous corn growing might be classed as a failure. Recently fertilizers were added to a part of this continuous corn land and in 1955 the yield was 86 bu. on the fertilized land compared to 36 bu. an acre without

fertilizers. The 36 bu. yield on untreated continuous corn was far above that of former years.

Going through results of past years, Professor L. B. Miller points out that high yields on this land have been the rule following a previous dry season. Since 1954 was a very dry season he seems to have the correct explanation for the unusually high yield on the untreated land. The fertilizers for one year consisted of 200 lbs. of nitrogen, 150 lbs. P^2O^5, 100 lbs. K^2O and 5 tons of finely ground limestone. Since 1955 was the first year of the test the amounts of fertilizers added in the future may be adjusted to the actual needs for maximum yields. This is additional evidence that a successful corn crop on the same land year after year is a possibility.

It is evident that continuous corn in time does cause a considerable decline in soil organic matter which in turn destroys the tilth of the soil. Turning again to the Morrow Plots, the continuous corn land in 1953 was found to contain 24 tons an acre of organic matter in the topsoil. The land which had the corn, oats, clover rotation was found to contain 40 tons an acre. There were 49 tons found in the topsoil where manure had been added to maintain the supply in the legume rotation. These results indicate that continuous corn had cut in half the total soil organic matter in the topsoil. This is assuming that the legume rotation and added manure maintained the soil organic matter near that of the original virgin prairie land.

A hospital is a place where they wake you up to give you a sleeping pill.

Granular DDT applied by properly equipped airplanes has been introduced as a new way to control corn borers giving up to 87 per cent control, according to USDA entomologists.

There has recently come into use wide-row corn planting. The increased space is used for seeding and subsequent growth of legumes and grasses between the corn rows. This growth of legumes and grasses between the rows may be used in continuous corn as a means of keeping up the supply of organic matter, improving the tilth of the soil, and preventing serious erosion. Experiment stations and farmers throughout the Midwest are making use of it. This plan offers numerous possibilities both in continuous corn and in rotations where legumes are a highly desirable part of the farm operation.

Broilers Fed More Cheaply on Corn

Free-choice corn fed as part of the finishing ration resulted in greatly reduced feeding costs . . .

Condensed from
Ohio Farm and Home Research

H. Yacowitz, John Wyne and *V. D. Chamberlin*

MOST broiler growers are now using finishing rations during the period from about 7 to 10 weeks of age. Some producers use commercial finishing rations, while others use a commercial broiler ration and feed varying amounts of grain.

The use of free choice corn for broilers has not been widely adopted because of the tendency of the birds to over-eat on corn. Over-consumption of corn usually results in poor feed efficiency. The experimental results reported here show that feeding free-choice whole corn during the finishing period resulted in reduced feed costs despite the fact that feed efficiency was not as good as that obtained with a broiler-finishing ration.

In January, 1954, twelve hundred Indian River Special broilers were started in six floor pens on new litter. The birds were fed the 1954 Ohio Broiler Ration (Ohio Ext. Bull. 343, May 1954) plus 0.0175 per cent sulfaquinoxaline. No fat was added to this ration. Hover-type lamp brooders were used to five weeks of age. At seven weeks of age the birds were weighed and started on three different finishing systems.

The following rations were fed to duplicate pens of broilers each of which contained 200 birds: 1954 Ohio Broiler Ration (22.8 per cent protein); Ohio Broiler Finisher (18 per cent protein); and 1954 Ohio Broiler Ration (22.8 per cent protein) plus free-choice whole corn. The Ohio Broiler Finisher was the same composition as the 1954 Ohio Broiler Ration except for the reduced protein level. The protein level was reduced by substituting ground corn in place of soybean meal. Insoluble grit was fed free-choice to all groups. Records were kept of mash and grain

Reprinted from Ohio Farm and Home News, Wooster, Ohio

Comparison of Three Systems of Finishing Broilers

Ration used during finishing period (7 to 10-weeks)[1]	Weight at 7-weeks[2]	Weight at 10-weeks[2]	Feed efficiency during 7 to 10-week period[2]	Approx. reduction in feed cost per 1000 birds when compared with broiler ration
	lb.	lb.	lb. feed/lb. gain	
1954 Ohio Broiler Ration (22.8% protein	2.09	3.46	3.73	——
Ohio Broiler Finisher (18% protein)	2.06	3.48	3.48	$15.50
1954 Ohio Broiler Ration (22.8% protein) plus free-choice whole corn	2.04	3.45	3.62	$54.00

[1]Free-choice insoluble grit fed to all groups.
[2]Average of duplicate pens.

consumption by weeks. The experiment was terminated when the broilers were 10 weeks of age.

It is interesting to note that growth was the same for all three systems of feeding. However, there were marked differences in feed efficiency. The best feed efficiency was obtained with the 18 per cent Ohio Broiler Finisher.

During the first week of the finishing period (7 to 8 weeks of age), corn consumption was 48 per cent of total feed intake in the groups fed free-choice corn. From 8 to 9 and 9 to 10-weeks, corn consumption was 57 per cent, respectively, of total feed intake. During the entire 3-week finishing period, grain intake averaged 53 per cent of total feed intake.

No cannibalism resulted from feeding whole corn. Feathering was good in all pens.

Economics of Different Finishing Systems

The following figures were

used to calculate the economy of these systems of finishing broilers:

1. Price that farmer would receive by selling his shell corn, $50.25 per ton. Cost of broiler ration (22.8 per cent protein), $4.50 per 100 lb.

2. Cost of broiler finisher (18 per cent protein), $4.34 per 100 pounds.

Based on the above figures, calculations showed that the use of the Ohio Broiler Finisher or the use of free-choice whole corn resulted in reduced feed costs when compared with feeding the Ohio Broiler Ration.

The economy of feeding whole corn free-choice will vary, of course, according to changes in prices of corn and broiler rations.

Since broilers will consume high levels of corn it is important to use a broiler ration that is *well fortified with vitamins and minerals when using this system of finishing.*

This experiment was conducted in cold weather when energy requirements are high. Further study is needed to determine the effects of feeding free-choice corn to broilers in hot weather.

Good Woodland Management Profitable

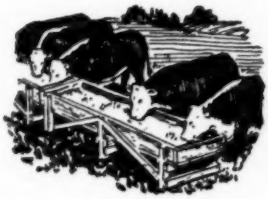
More than 40,000 board feet of lumber have been sawed from trees cut in the management of a 32-acre woodland demonstration area at the Dixon Springs Experiment Station of the University of Illinois. But there is just as many board feet of standing timber now as there were five years ago and the quality of the trees left in the stand is higher.

No magic in this, says W. R. Boggess, professor of forest research at the Station. It's simply the result of common sense and good woodland management.

After they estimate growth, the foresters then mark enough trees for cutting to equal the volume of expected growth during the cutting year. The first cut was strictly an improvement in which lower quality and overmature trees were removed from the stand. The result has been to hold the total stand volume steady and improve the quality of the remaining trees.

Trees have been removed in annual cuts. The lumber produced has been used for a variety of purposes on the Station, including construction and maintenance of buildings, feed bunks and fence braces. Boggess believes that you'll get the highest possible returns from good woodland management if you use products on your own farm. *Report from Dixon Springs*

More Silage Will Mean Cheaper Beef



The author offers definite suggestions to cut the costs of beef production . . .

Condensed from Breeder's Gazette

Howard J. Gramlich

ONCE we believed good beef could only be produced in the Cornbelt and using only matured corn kernel. It mattered not if a steer lumbered off the farm after having consumed 100 to 200 bushels of corn. The main thing was that he top the market.

Those days are gone. We face an entirely different set of conditions today. In the first place, we probably will never again see cheap corn.

Consumers today do not want excessively finished beef. To be sure, fancy hotel and restaurant trade will take the ribs and loins of a certain volume of Prime beef. But let's think of the thousands of chain stores over the country which are catering to Mrs. Average Housewife. Let's remember how cautious she is at the self-service counter, selecting cuts almost free from removable fat.

I believe the most important single factor affecting beef production in the future will be silage. This useful feed has been kicked around in this country for a half century. While its use has been increasing in recent years, the field has scarcely been scratched. The beef of tomorrow will be produced with an ever-increasing silage ration.

Modern methods make it possible to harvest, store and feed ensilage with a minimum of labor, thus overcoming the big criticism of a quarter century ago. Field choppers, horizontal-above-ground silos, either self-feeders or manure forks on tractors have about eliminated slavery.

We are now using, in a limited way, a machine which removes ears from corn stalks before they go through the ensilage cutter. At cutting, the ears have dried to about 30%, and the stalks and leaves are still in pretty good condition to make silage. The corn is virtually matured, and by the use of a little artificial drying may be preserved in A-1 condi-

Reprinted by permission from Breeder's Gazette, Spencer, Indiana

tion. This practice may hold tremendous possibilities.

One has only to look at a forlorn brown cornstalk field. Most of the leaves are already shattered off and in the mud. What a large amount of waste in livestock feed occurs when the plants are left to be grazed by cattle! Not infrequently about the time the fields dry up to a point where cattle can be turned in, snow starts to fall and stalks may remain covered until field work opens the following spring.

When corn is put in the silo at the usual time, practically all of the feeding values of the plant, as well as the ear, are conserved in a highly palatable and nutritious condition. With corn borers over the entire corn belt there is an additional advantage in the making of corn silage: many borers are pickled in the silage and consequently eliminated from being hazards the following year.

The field chopper revolutionized ensilage-cutting while the horizontal - above - ground silo is rapidly revamping the storage. I look for tremendous developments in these units. They will be built on a concrete floor with either temporary or permanent side walls. They can be of any length and any width, or almost any depth. There is no limit to the amount of silage which can be stored.

Why all this emphasis on silage from the standpoint of the cattle feeder? Well, it adds a tremendous amount of all-important flexibility to a semi-hazardous type of industry. Cattle can be started on silage and as the market begins to show promise, can be given a quick grain finish. Or, if the outlook remains drab, young cattle can be carried on the silage ration 4 or 6 months longer. This cannot be done economically on a dry grain feed ration.

Cattle can be started on silage any week in the year and marketed off of it on the same basis. And silage is a great stabilizer from the standpoint of supplementing pastures. In most of the cornbelt we are dependent upon rain for midsummer grass. Not infrequently cornbelt farmers have no pasture as the range cattle season opens in late July and August. With a supply of old silage they can buy thin stock from drouth range areas and get them started toward an early winter market, which usually is profitable. Most cattle feeders still buy in the fall and sell at about the same time in the winter and spring. In other words, they are in each other's way both at buying and selling time. Silage will help alleviate this.

Let's not forget that silage can be made from any plant that grows on a farm—corn, sorghum, grain, or weeds. Men who still

try to put up the first-cutting of hay in June mess around in the rain and are a long time getting the job done. Not infrequently they have to turn the windrows over several times, and when they eventually get the grass to the haystacks most of the leaves are left in the field. How much easier it would have been to have cut that grass and put it in a silo.

Late in the summer of 1934 in Nebraska, following the Big Drouth, we had some rain. This made a pretty fair growth of Russian thistles and kochia (Mexican fire bush). It was amazing to see cattle go for silage made from these weeds, as well as of pig-weeds and such others as were able to withstand the spring and summer drouths. These silages helped get semi-starved cattle in pretty good condition during the late fall and winter—and incidentally, enabled their owners to hold them until their value on the market had more than doubled. I remember a 3,400-ton stack of damaged field corn and weeds in eastern Nebraska. Silage can be preserved in the open in any size pile. The canning factories have been doing it for years.

During the past few years quite a few men have started the practice of cutting oats for silage. They feel that they have a good return per acre from the silage. In addition, their clover seedings develop more rapidly and make a splendid late summer growth for either hay or grazing.

In the High Plains region where drouth in midsummer is fairly frequent, various sorghums, such as Atlas Sorgo, are being grown in preference to corn as silage crops. They stand midsummer abuse much better than corn, and with the advent of August rains make a terrific tonnage of very palatable silage. An advantage of silage seldom mentioned is its immunity to fire loss.

Another bit of revolutionary technique has come to us through the work of scientists, such as Dr. Beeson of Purdue. They have shown the way to feed silage to best advantage. The use of supplements which stimulate the action of the bacteria in the paunch and thereby enable cattle to digest the silage, represents a big step forward in the efficient utilization of this feed.

Admittedly, there are some disadvantages to silage. The man who uses it liberally may never top the market. However, he might well remember Liberace's famous retort when asked if his critics worried him: "My brother George and I think of them on our way to the bank," he said.

People love beef. It is the No. 1 meat with the great majority of consumers. If their in-

comes are limited they will look for bargains; and ensilage-made beef can be sold on the bargain counter without spoiling the credit of the producer. Certainly this cannot be said of beef made largely from rations of dry grain. Under present costs a pound of such gain needs about 30 cents to pay the bills. Silage will do much more efficiently.

Cud Inoculation Not Beneficial

Several years ago it was announced to dairy farmers that cud inoculation of dairy calves was beneficial. As some of the cud from the cow's mouth was placed in the calf's mouth, the protozoa that help break down cellulose contained in hay and other roughages would be transferred to the calf's stomach. The presence of these organisms was supposed to cause the calf to be able to eat more hay, grow faster, and cost less.

To determine the value of such inoculation, Dairy Husbandmen at West Virginia University Agricultural Experiment Station conducted tests with more than 50 calves. Half of the calves were inoculated, and the other half were not. The test included comparisons of three feeding methods, which were conducted over a period of three years.

Half of the calves were inoculated each week during the first six weeks following birth. A small sample of the rumen contents was pumped from each calf each week, and protozoa noted by microscopic examination. Precautions were taken to prevent calves from mingling with each other and inoculation occuring naturally.

The calves that received rumen inoculation had protozoa in the rumen by the second week following inoculation. At the end of eight weeks, protozoa were present in the rumens of half of the non-inoculated calves, and only two calves lacked protozoa at 16 weeks.

Under no feeding method were the inoculated calves superior in growth. In fact, under each feeding method the non-inoculated calves made somewhat larger gains at a slightly less cost per pound.

The Experiment Station workers say that under normal management conditions, cud inoculation is unnecessary and impractical. Most young calves become inoculated naturally at an early age, and placing protozoa in the rumen when quite young does not pay off in faster or cheaper gains.

West Virginia Experiment Station

A Young Man Can Buy a Farm

Rent as big as you can, put all your available money where it will get you the biggest return, and when you have enough rented acres, start buying land out of earnings . . .

Condensed from Successful Farming

Stan Geiser and *Wayne E. Swegle*

IN 1941, Dave White started farming without enough money to buy a tractor. This year he's farming 992 acres—and buying 290 acres of it.

This progress hasn't come by chance. Dave has followed a simple recipe—liberally seasoned with skillful management — to bring him to his present happy financial condition.

Too many young farmers tie up all their money in buying a farm that's too small—they have little money left for *operating* expenses and they end up in financial difficulty.

Since Dave had no money for machinery when he started farming in 1941, he started farming with his father. He could furnish only his labor, so received a third of the income—plus the chance to learn from an experienced farmer. Dave and Mrs. White kept their living expenses low, used most of their income to buy some secondhand farm equipment. In 1942, he rented 60 acres near the home farm. Dave kept his working agreement with his father. With some equipment to contribute to the business, he went on a 50-50 basis with his dad. The next year he kept the 60 acres and rented an additional 80 acres.

Dave increased his rental acreage as fast as he could. By 1944 he was farming 300 acres. In 1945 the Whites rented a 412-acre farm near Morristown, Indiana—and moved there from the home farm at Raleigh.

In 1952 Dave had a chance to buy a 100-acre farm near the 412-acre farm he rents. He bought it, with his father-in-law. (The house on this farm provides a comfortable home for Mrs. White's parents, and they can handle the well-mechanized broiler business and dairy operation developed by Dave and his father-in-law.)

In 1953, Dave bought 230

Reprinted by permission from Successful Farming, Des Moines, Iowa

acres near Morristown. This farm and the 100 acres bought in 1952 were purchased on a land contract, since Dave didn't have enough down payment for a regular loan. Dave is still renting as much land as he can handle to pay for the farms without sacrificing a good standard of living for his family, which now includes a son and daughter.

That's a brief story of the progress the Whites have made in farming. But it didn't just happen. In 1941, Dave worked out

If you could make all men think alike, it would be very much as if no man thought at all. —Phillips Brooks

management principles which he says have helped him get the kind of net income that permits him to buy land without too much fear. His principles are sound for young couples who want to start farming today.

The first and most important principle is, as Dave puts it, "Rent a farm that is big enough to make you a sound profit at first. I don't think you can rent a small farm, or buy a farm of say 100 acres, and ever expect to make enough to pay for it."

"Second," says Dave, "treat your rented land like you would your own. Don't be afraid to add or remodel buildings or build up the soil. You'll get your money back—and then some." Work out plans with the owner, share the cost. If necessary, put a clause in your rental agreement that you'll get repaid for the unused part of your building investment if you move. If you get a good farm with a sensible owner, this kind of approach makes more money for *both* you and the owner—the owner can't afford to have you move.

Third, use your credit where it works the hardest for you. "I've found I get more return per dollar invested in fertilizer than in any other single place," he says.

Fourth, "Don't waste anything." Dave plans rotations to get the highest return from every acre. That means lots of corn and soybeans. With lots of acres, machinery cost *per acre* is low. He stocks the farms heavily with livestock, fits times of high labor requirements for stock to periods when fieldwork isn't so pressing. This gets more volume per hour of labor, thence higher wages. And he doesn't let buildings lie idle; he converts them to accommodate livestock that can best utilize the space.

Fifth, Dave believes in *diversifying* to counterbalance swings in prices of any one product—but he makes each enterprise *big enough* to make money. His father-in-law raises broilers and takes care of the 20-cow dairy herd; Dave raises hogs, some

sheep, and keeps a beef-cattle herd.

And sixth, "I do everything I can without hiring outside, high-cost labor." For example, Dave recently built a corncrib with his own and hired men's labor, instead of hiring carpenters. It cost only 20 cents per bushel capacity and is adequate to seal corn under government loan. He can dry corn in it, and unload it with a drag, saving scooping.

Sixty-two per cent of livestock production in the United States is west of the Mississippi. Sixty-nine per cent of the United States meat production is eaten east of the Mississippi.

His welder is one of his top cost cutters, saving trips to town, reducing breakdown time. And he has built two steel hopper-bottom self-unloading wagons, two grain elevators, a self-unloading wagon with a short auger in the rear for hauling feed and filling feeders, and similar pieces of equipment. These have saved money.

When Dave moved to the 142-acre rented place in 1945, yields were unappealing. Corn went about 50 bushels per acre.

Dave had all the soil tested. Then he changed the arrangement of every field—made fields longer, more regular, and more efficient. He picked up 5 extra acres in the process. He went to work with fertilizer, and has been increasing yields continually since 1945.

Here's an example of his fertilizer use: In 1955 for corn, he plowed down 400 pounds of 0-20-20, added 60 pounds of 12-48-0 starter, and side-dressed with 70 pounds of anhydrous ammonia. His oats received 500 pounds of 10-10-10. Pure alfalfa fields were top-dressed with 400 pounds of 0-20-20, and his mixed hay with 400 pounds of 10-10-10. The pay-off: corn yields are pushing 100 bushels per acre, other yields are rising.

Dave feels that every farm whether rented or not, needs to be farmed individually. He uses rotations geared to each farm—with as much corn and soybeans as the land will stand with lots of fertilizer. That gets him top cash returns per acre.

Hogs are the mainstay of Dave's livestock program. He keeps about 60 sows for January and July pigs—when he can be with the sows at farrowing time without interfering with field-work. He also hits better markets with this timing. He uses 3-way-cross sows and hybrid boars, aiming for meat-type market hogs that bring the highest price.

He converted a large, and otherwise, useless, barn to farrow-

ing pens. Now the barn works for him, instead of being just a tax liability.

The broiler operation, which Dave manages with his father-in-law, is a typical example of the planning and attention to details he puts into the whole farm business.

First, it is big enough so they could afford to make it efficient. They market about 4 bunches of 5,000 birds each, per year.

To house the broilers, they built a 36 x 120-foot building of home-grown, rough-sawed lumber and concrete blocks, with a metal roof. Dave and his father-in-law did all the work, even poured the concrete. It only cost about $2,600 including labor, and complete with hovers, ventilating fans, and self-watering system.

Automatic watering and feeding keep labor costs very low. That, plus a remarkable feed conversion make broilers a profitable enterprise.

In June, 1955 they sold 4,900 broilers weighing a total of 15,061 pounds, or slightly over 3 pounds each. The birds were only 9 weeks old. Each pound of meat took only 2.45 pounds of feed. Cost per pound of meat was about 18 cents.

They use a new strain of broilers which includes White Rock, Cornish, and other blood. Debeaking helps, too, he believes, as does a new bite-size broiler feed. "The chicks seem to eat a lot more and gain faster when we feed the bite-size feed," he says.

Farming today is a complicated business. It requires many things—keeping records to see where you're going, using them to plan ahead, studying new methods and applying them to your operation, paying attention to details. Dave threw every cost cutter he could learn into the business, headed for top yields and high volume. He got the most out of his money, labor, and land.

Field trials in Australia have confirmed the value of chloromycetin in the treatment of foot rot in sheep. In three trials 92 per cent of all affected feet were cured by one or two applications of chloromycetin in methylated spirit.

He had no special breaks. But where there were special opportunities, he was smart enough to cash in on them.

Getting a start in farming wasn't easy for the Whites—it seldom is. But with ambition, eagerness to learn, and the intelligence to manage, they succeeded.

You Can Make Money On A Small Farm

A young, "small" farmer tells how he meets today's problems and aims for a big farm in the future . . .

Condensed from The Young Farmer

Kenneth Kopp

YOU hear a lot of talk these days about the problems faced by the young farmer. You also hear a lot of talk about the tough times ahead for the small farmer. Well, I guess I must be in double trouble because I'm a young small farmer.

I think I've got lots of company, too, because most of us young farmers are small farmers. Not very many young men are able to start right out farming with a big spread. We all want to own a large unit eventually, but that takes a lot of money—and money doesn't grow on trees. At least, it doesn't on my place.

All of which adds up to this—if we are ever going to get that big farm, we're going to have to make money on our small farms.

The problem, then, is how to make our small farms produce a good living for us, plus a little extra to put in the sock. I happen to think this can be done. I'm not starving, and I don't think my farm is a bit better than any of thousands of other small farms.

Before we start talking about raising small farm incomes, though, let's define the term—and this isn't easy. You can't define a small farm in terms of acres. A 40-acre poultry farm can be larger than a 400-acre wheat farm; or 300 acres of light or swampy land can be smaller than 100 acres of rich prairie soil.

If the size of your unit keeps that extra tractor, barn cleaner, or new barn in the "dream" stage, then perhaps you have the size of farm we are talking about. We really don't have to define a small farm, though, because if you have one, you know it.

My farm is 103 acres, of which 60 are tillable and the remainder are in permanent pasture because they're too hilly to cultivate. The soil isn't the best and we have a short growing season, so I call myself a small farmer.

Reprinted by permission from The Young Farmer, General Mills, Inc., Minneapolis 1, Minnesota

And, if you're like me, you've got problems.

Let's look at some of these problems and see if there is any hope for us. I think there is. I think there's more money on most of our small farms.

First, let's appraise our position. We might not be as bad off as we think. Remember, large farmers have problems, too. And their problems are so big that perhaps it's just as well that we can't get our hands on a good-sized unit until we have plenty of experience.

Look at the advantages of the small farm. First, there's the difference in capital investment. The big farmer has a tremendous amount of money tied up in land, equipment, buildings, livestock, and crops. If the small farmer buys carefully he can get by with a fraction of this investment.

The small farm also has a low labor requirement. This is mighty important during a cost-price squeeze such as we are now experiencing. A large payroll can be burdensome. Most small farmers don't have this problem. The cost of their hired labor is often no more than the price of a new spring coat for the wife.

Small farms are more flexible, too. The small farmer can change crops and management practices in a hurry because his units are small and manageable. It takes time and money to make major changes on large tracts of land.

Now that we've looked at the advantage of the small farm, let's look at the disadvantages—and there are plenty. These vary a lot but in most cases you will find small farmers talking about the same big problems. These problems include inadequate and inefficient buildings; old and inadequate machinery and equipment; too little fertile soil; low producing livestock; and a shortage of w o r k i n g capital.

These things, I think, are caused by the "smallness." However, in spite of these disadvantages, there is a good living potentially present on our small farms if we know where to look.

If I had to tell in one word how to make money on a small farm, I would choose the word efficiency. In itself, that doesn't mean much since we are constantly told that efficiency is the key to success in everything—from managing a multi-million dollar corporation to doing the routine chores. But let's start with that time-worn symbol of success anyway.

On a small farm, efficiency can be increased by using either or both of two approaches. One is a more *extensive* use of the factors of production—land, labor, capital, and management. The other is a more *intensive*

use of these same factors. The first approach has greater long-range significance and can be reached by purchasing or renting additional land.

The second approach has greater short-range importance since it concerns our task of feeding the family from day to day. And it is the most important of the two because it applies to all of us small farmers, regardless of future plans.

There are seven major factors that should be considered in intensifying your production. They are: (1) proper choice of enterprises; (2) specialization vs. diversification; (3) high production per unit; (4) labor saving techniques; (5) conservation of machinery resources; (6) product specialization; (7) constant experimentation. Here's what each one involves.

Reports from 10 agricultural colleges show that the demand for graduates in agricultural journalism exceeds the supply by six to one.

The selection of enterprises for your farm is of basic importance. We must produce those commodities most adaptable to the type of farm and locality. This is not a new innovation in farm management, and I presume most of us are trying to do this right now. Nevertheless, it may be a good idea to reappraise our present system. Perhaps some changes can be made to increase our efficiency.

If you have traveled through western Wisconsin and seen the hills along the Mississippi, you will have an idea of the type of land found on my farm. Because of the extreme slopes, forage crops predominate the area—and the livestock are chiefly forage consumers. In this way, we adapt our farming program to our soil and land characteristics.

But many farmers, including myself, are going only part way in producing the most appropriate crops or livestock. For example, on our farm we have dairy cattle, sheep, and hogs. Considering the terrain, hogs are the least suitable. Our efficiency could probably be increased by transferring the resources used in hog production into the sheep or cattle enterprise. Perhaps we will try it in the future. We raise hogs mostly because we like them —but sentiment doesn't pay the bills.

It may take a little research and considerable thought to find the right combination of enterprises. And it is a good idea to go slow on the changeover. It is safer to defer the investment of a great deal of money in equipment until you know the change will be profitable.

The second approach to the

problem of increasing efficiency concerns the choice between diversification or specialization. This subject has been debated for years by people a lot smarter than I am. But there are a few simple rules that may be helpful.

Specialization is more efficient than diversification. But we know it is risky to have all our eggs in one basket. Large operators who specialize can afford to take losses and offset them against the profit of the good years. How about us small farmers? Can we keep the wolf from the door during the lean times? Can we make the necessary investment? Probably not. I think diversification more properly fills the needs of the small farmer.

We can compromise, however, by specializing to some extent within a program of diversification. You might have a small local market broiler operation, for example.

Being a livestock enthusiast, it is natural for me to put in a "commercial" for the livestock business. Livestock fit in well on most farms. They produce a second source of revenue—arising from the conversion of homegrown feeds into meat or livestock products. They also keep us busy in the winter.

Another important consideration in the selection of enterprise combinations concerns the price stability of the products. Certain commodities have characteristic price fluctuations seasonally and annually, like hogs and poultry. Others have considerable price stability — for example, dairy products and most field crops. Generally, the profit margin is lower in price stable products, and vice versa. It is a good idea, where possible, to combine the production of price stable commodities with those having price variation, thereby getting the advantages of each — risk alleviation and higher profits.

Our third point is increasing our efficiency through attaining high production per unit. Each acre of cropland, each cow, pig, sheep, or chicken should be considered an individual machine in order to obtain every possible ounce of productive power from the total farm plant.

To permit each "machine" to operate at top efficiency, there are three things we must consider -- breeding, nutrition, and general management practices. Where can we learn more about these three essentials? Just pick up any farm paper—it's full of ideas. And our colleges and experiment stations have compiled a mass of information concerning these problems. As taxpayers, we are being shortchanged if we don't take advantage of their excellent work.

We must also consider the

proper amounts of "fuels" for our "machines." We must vary our level of production according to the costs and expected returns. This year, for example, the price of milk increased more than the cost of feed, so it paid to give the dairy cows an extra ration of feed. This same rule applies whether you raise hogs, wheat, or peanuts.

sires. Each breeding animal should earn her place in the production line.

A fourth means of attaining top efficiency on a small farm concerns labor saving techniques.

Unfortunately, much labor saving machinery and equipment is too costly for small farmers. Recently, though, there has been an increase in the manu-

nsive
ors.
nent,
ıtion
andy
p in
l we
ɔs in
and
Per-
one
sows
day
Last
e to
silo.
ıtial-

NEW SUBSCRIPTION ORDER FORM

Send FARMER'S DIGEST to me for

☐ 3 Yrs. at $6.50 ☐ 2 Yrs. at $4.50 ☐ 1 Yr. at $2.50

I enclose $_____. ☐ Please bill me.

Name.....

R.F.D. or Street.....

Town and State.....

Canada: $6.80 for Three Years; $4.70 for Two Years; $2.60 for One Year

Mail to—FARMER'S DIGEST, Fort Atkinson, Wisconsin

top production. But I would like to emphasize the importance of productivity testing in livestock, since it is a new era. Dairy cattle have been tested for their productive ability for years. Now production tests are being used for sheep, swine, and beef herds. The index of productivity obtained from these tests is a very helpful guide in culling or selecting replacements and herd

ter with cattle.

Some farmers have tried once-a-day grain feeding to dairy cattle and swear by it. Some hogmen use farrowing crates and claim they now sleep nights when the sow is in delivery. Large poultry farmers have out-mechanized all of us. Maybe some of their ideas can be adapted to small flock owners. And how about crop production? This

problem of increasing efficiency concerns the choice between diversification or specialization. This subject has been debated for years by people a lot smarter than I am. But there are a few simple rules that may be helpful.

Specialization is more efficient than diversification. But we know it is risky to have all our eggs in on
who s
losses
the pr
about
keep t
ing th
the n
ably r
more
the sr

We
by sp
within
tion.
local
for ex

Beir
is natural for me to put in a "commercial" for the livestock business. Livestock fit in well on most farms. They produce a second source of revenue—arising from the conversion of homegrown feeds into meat or livestock products. They also keep us busy in the winter.

Another important consideration in the selection of enterprise combinations concerns the price stability of the products. Certain commodities have characteristic price fluctuations seasonally and annually, like hogs and poultry. Others have considerable price stability — for example, dairy products and most field crops. Generally, the profit margin is lower in price stable products, and vice versa. It is a good idea, where possible, to combine the

It all goes to show that farming is like any other business . . . .

You have to keep informed to succeed with it. That is why Farmer's Digest is so important to you . . . why you should read every issue. Only Farmer's Digest gives you so much usable information in palatable, easy-to-read form at so low a cost. In Farmer's Digest, you get the very best from more than sixty U. S. and foreign farm magazines.

[illegible] breeding, nutrition, and general management practices. Where can we learn more about these three essentials? Just pick up any farm paper—it's full of ideas. And our colleges and experiment stations have compiled a mass of information concerning these problems. As taxpayers, we are being shortchanged if we don't take advantage of their excellent work.

We must also consider the

proper amounts of "fuels" for our "machines." We must vary our level of production according to the costs and expected returns. This year, for example, the price of milk increased more than the cost of feed, so it paid to give the dairy cows an extra ration of feed. This same rule applies whether you raise hogs, wheat, or peanuts.

Obviously, working alone, we cannot accurately determine how many tons of fertilizer to apply to our crops, or how much grain to feed the cows. But in most cases this has already been worked out by men at our colleges and experiment stations. The vocational agriculture teacher or county agent will be glad to help us obtain the pertinent bulletins. In other cases, we can use some "by guess and by gosh" and a little simple arithmetic and come up with a pretty good answer.

It is not necessary to list all the practices that help achieve top production. But I would like to emphasize the importance of productivity testing in livestock, since it is a new era. Dairy cattle have been tested for their productive ability for years. Now production tests are being used for sheep, swine, and beef herds. The index of productivity obtained from these tests is a very helpful guide in culling or selecting replacements and herd sires. Each breeding animal should earn her place in the production line.

A fourth means of attaining top efficiency on a small farm concerns labor saving techniques.

Unfortunately, much labor saving machinery and equipment is too costly for small farmers. Recently, though, there has been an increase in the manufacture of some fairly inexpensive equipment for small operators.

The purchase of equipment, however, is not the only solution to the problem. Some handy gadgets can be cobbled up in the farm shop. Maybe all we need is to retrace our steps in doing the routine chores and eliminate the wasted ones. Perhaps self-feeding livestock is one answer. Self-feeding brood sows saves me about an hour a day during the winter months. Last year I self-fed grass silage to breeding ewes from a trench silo. This has tremendous potentialities, and should work even better with cattle.

Some farmers have tried once-a-day grain feeding to dairy cattle and swear by it. Some hogmen use farrowing crates and claim they now sleep nights when the sow is in delivery. Large poultry farmers have out-mechanized all of us. Maybe some of their ideas can be adapted to small flock owners. And how about crop production? This

phase of farming is way ahead of the livestock business, but there are still ways left to cut steps.

This brings up the next point —reduction of investment in facilities and machinery. Because most small farms are diversified, a large variety of machinery is needed to perform relatively small jobs—or hand labor is substituted. Both are costly. If you're looking at a new piece of machinery, consider its flexibility. Take the forage harvester for example. It can be used to put up hay and grass or corn silage; chop straw or corn stalks for bedding; and even for threshing. Thus five pieces of machinery have lost their jobs—the baler, grain binder, thresher, corn binder, and ensilage cutter.

Machinery dollars can also be stretched by possible changes in the crop system. Take the low-producing oats crop, for instance. By harvesting oats as silage, the need for conventional harvesting equipment can be eliminated.

The same is true of farm buildings. Inexpensive remodeling often provides greater use. New buildings should be as inexpensive as possible and planned for flexibility.

A sixth approach to increasing efficiency deals with product specialization. I don't mean specializing in the production of one farm commodity—but rather producing commodities which are distinguished from the average for one reason or another. Such products command a higher price on the market.

Examples are purebred livestock, hybrid corn or certified seed, milk for fluid consumption, and fertilized eggs for hatcheries or broiler plants. There are many others.

There are disadvantages to this type of production. More resources are required — labor, equipment, and know-how, to mention a few. And the risk is greater. But it has been a paying proposition for many small farmers. On our farm, purebred sheep and hogs have been lifesavers.

And finally, we must apply the findings of research to our farming program. In order to compete profitably for the consumer's dollar, we must constantly search for new and better methods. To make a profit, we must do each job a little better than anybody else. Research helps.

If you are a small farmer and find the going tough right now, the decision is yours whether to call it quits. There are some farms too small and unproductive to make a good living regardless of what is done. But there are also those which can be developed into units that will compete profitably in the present economic environment.

What We Know About Bloat

No one knows what causes bloat, but one thing is sure: It's better to avoid bloat than worry about "cures" . . .

Condensed from Wisconsin Circular 446

EVERY YEAR bloat causes a sizeable money loss because of the death of animals, interrupted growth, and lowered production. Veterinarians treated an estimated 13,000 cases of cattle bloat in Wisconsin in 1951. Many other cases, of course, either died or were handled successfully by the farmer himself or recovered without being recognized or treated.

Bloat causes another serious loss. Fear of it among livestock men has cut down the use of such valuable pasture crops as alfalfa, ladino, and some of the other legumes. This could become a limiting factor in grassland farming programs.

What Are the Signs of Bloat?

Bloat is simply the building up of gas pressure in the paunch of the animal. A swelling in the left flank is the first obvious sign. The animal's eyes bulge; it becomes uneasy; it stops eating, and it may become frantic in its efforts to lessen the pressure of gas in its paunch.

There is no evidence that the gas itself is poisonous or that an unusually large amount is being produced.

What probably happens is that something takes place within the animal that keeps it from belching off the gas in the usual way. Excessive frothing of paunch contents on fresh legumes and on heavy concentrates is thought to be the cause. If the gas is trapped in the bubbles of the froth it cannot be belched. Micro-organisms in the paunch keep on producing gas, and so the pressure builds up.

Some animals with free gas over the paunch contents will eventually belch and relieve the pressure. It sometimes helps to make them move or walk up an incline.

Those animals with little or no free gas over the paunch contents cannot belch and will die

Reprinted from Wisconsin Circular 446, Department of Veterinary Science, University of Wisconsin, Madison, Wisconsin

unless the stockman does something to relieve the pressure.

Bloat is a Feeding Problem

Bloat occurs wherever cattle or sheep are raised. In this country acute bloat — the kind that may call for emergency treatment — usually occurs on legume pastures, either early in the spring or during rainy periods in the fall. It often occurs when animals are first turned onto legume pastures.

Animals seldom bloat on grasses, coarser pastures, or hay. Bloat occurs less frequently in pastures that contain at least 50 per cent grasses.

Bloat usually follows a heavy feeding or grazing period. Animals that are hungry and greedy feeders are more susceptible. Frost, dew, or rain on the field often are accompanied by cases of bloat, and it seems to be agreed that more animals bloat during periods of rapid plant growth. Heavily grained animals occasionally bloat if there is too little roughage in their ration.

The best producers in a herd, or the animals that put on best gains, often are the first to bloat.

Legumes Are Good Feeds

Alfalfa, ladino, and other legumes are good livestock feeds. Fear of bloat shouldn't make dairymen unwilling to make full use of them. The secret appears to be in the way they are fed.

If you have a legume crop that you are uneasy about using as pasture, you may find it practical to cut enough for the herd each day and feed it in the barn or lot as fresh feed. Be sure to cut low enough that stems are included with leaves. In many cases, cutting and feeding the top three inches of the plant will cause bloat from a crop that would be safe if the coarse stems were included.

If daily cutting isn't practical for you, strip graze sections of the pasture small enough to force animals to eat stems as well as tops of the plants. Keep some good palatable hay in the same field, to make sure the animals can get enough coarse or rough material for good paunch function, and, pasture legumes only after they are in full bloom.

Looking Ahead to Next Year

Planting can be planned to reduce the danger of bloat, but there is so much difference in crop patterns from one farm to another that only general suggestions can be given.

Legumes planted alone can be cut and fed fresh day by day, or made into grass silage and fed the year round, or cut and stored as hay.

The trouble with using them for pasture is that no one can say for sure that a particular stand of legumes is safe at a particular time. In general, bloat is not a

serious problem on legume pastures if you avoid the periods when the plant is growing rapidly.

Grass and legume mixtures are another possibility. Fields with at least 50 per cent grasses are usually safe. However, climate and other factors may make it hard to keep a dependable pasture with the two kinds of plants in the right proportions.

In mixed pastures watch what the animals are selecting to eat. If the grass is cropped short or if it has matured and become less palatable, the animals may select young legume tops which increases the chances of bloating again.

Some General Precautions

Start animals in legume pastures gradually—an hour or so the first day, a little longer on each succeeding day. A gradual change in feeding practices is usually better than a sudden shift, and seems in this case to give cows a better chance to get accustomed to the legumes. Watch them closely to see what they are selecting to eat. Try to avoid their eating all leafy legumes.

Don't turn hungry cows into legume pastures. If they fill up too quickly, they are more likely to bloat.

Keep cows off legume pastures during and just after moist weather, especially in early spring and the wet season of the fall. When plants are short and weather favors rapid leaf growth, the danger of bloat is greatest.

That Chronic Bloater

A chronic bloater is an animal that fills up with gas after every feeding. Chronic bloat leads to poor production or failure to gain adequately.

There are many possible reasons for chronic bloat, and a thorough examination by a veterinarian is usually worthwhile. If a chronic bloater is getting considerable grain you can sometimes correct the difficulty by feeding more roughage and cutting down on grain.

Enough eating space at the feed trough will reduce competition for feed and thus avoid bloat that results from hasty and ravenous eating. Often a greedy feeder that has a tendency to bloat can be kept apart from the herd and fed oftener and in smaller amounts to discourage eating too rapidly.

Prevention and "Cure" of Bloat

Many surface active agents can reduce froth experimentally. Some of these agents have been used successfully to treat bloated animals. Some are not safe for routine feeding to keep cows from bloating. Research on the practical application of the safe products is in progress. The best

practice is to await safe and tested products for prevention.

Insurance May Pay

To safeguard against sudden and often crippling financial losses, insure at least the most valuable animals in the herd.

What Can I Do in Emergency?

1. When an animal is very badly bloated and shows no signs of recovering without help, getting her paunch pressure down becomes an emergency. Insert a sharp instrument—a jackknife or trocar—deep into the most swollen part of the left flank to let the gas escape.

If a trocar and canula are available they are better to use than a jackknife, since the tube or canula can be left in place until the pressure is fully relieved and usually the wound heals better afterward.

The wounds caused by "sticking" should be kept clean. Most often they are slow in healing and may need medical attention.

2. When cases of bloat appear in a herd, move all animals temporarily to rougher pastures or give them access to palatable hay. Avoid watering the animals for four to five hours.

3. In less severe cases of bloat —if there is time—get a veterinarian to relieve the gas pressure with a stomach tube, thus avoiding a messy slow-healing wound in the flank.

He can also medicate the animal then, if that is necessary, and thus usually bring her back to normal sooner than if she is neglected.

Strong medicines to stop the action of micro-organisms in the paunch usually do more harm than good, because micro-organism action is necessary for normal digestion.

Medication to stimulate the appetite is often a good thing because it gets paunch activity back to normal sooner and helps keep the animals loss of weight or lowered production at a minimum.

New Technique in Corn Borer Control

Granular DDT applied by properly equipped airplanes has been introduced as a new technique in the control of corn borer by entomologists from the United States Department of Agriculture.

Up to 87 per cent control was achieved by air-seeding granulars through properly equipped airplanes during 1955 tests in Illinois. Best distribution and results were achieved with rice seeding equipment when the airplane flew 35 to 40 feet above the ground, covering 14 to 15 corn rows. Ground treatment also gave up to 87 per cent control in the tests. —*University of Illinois*

New Tilt-up Farm Buildings

A new idea for building with concrete. It's easier to pour concrete on the ground . . .

Condensed from Missouri Ruralist

NEW techniques have opened new fields for using concrete in farm structures. Latest idea is the "tilt-up" method of construction in which pre-cast slabs are formed and poured on the ground, then lifted into position.

This new technique was first used on farms for building concrete tilt-up walls for horizontal silos. Slabs are poured on ground with 4-inch forming lumber, then tilted into position. Next, tilt-up buttresses were designed for supporting silo walls where the silo is built on level ground. Now, the same principle has been used to build on open-front, 20- by 50-foot cattle shed on the farm operated by Harold E. Jacobs, Boone county, Missouri.

Not only does the building appear almost indestructible with its concrete walls and metal roof, but cost was quite reasonable. Counting all materials and labor the 20- by 50-foot structure cost a little more than $800.

Big advantage of the tilt-up method of working with concrete is that no expensive forming lumber is required. No form is more than 4 inches high. Using the same technique as developed in constructing tilt-up horizontal silo walls, the walls of the cattle shed are merely concrete slabs poured on the ground using 2- by 4-inch forms. The walls were reinforced with steel.

Bolts are left protruding thru the side of form on top of slabs. These bolts serve a double purpose—first a lifting handle can be attached to the slab for tilting the section into place. Then the bolts can be used for fastening the wooden plates securely.

Slabs were 5 feet wide, 10 feet high and 4 inches thick. This poses a problem of lifting slabs into place—they're heavy. A farm tractor is too light for this job so it was necessary to hire a heavier machine. A crane and operator were used on the Jacobs farm, costing $40 at the rate of $10 an hour.

Actually, walls of the building are 8 feet above ground, are in the ground 2 feet. To serve as a footing a trench was dug 2 feet wide and pads of concrete

Reprinted by permission from Missouri Ruralist, Kansas City, Missouri

were poured for the walls to rest upon. No forming was used for this footing, little piles of concrete were put in the bottom of the trench and the tops smoothed off using grade guides.

Total material cost was $593.62 for the structure, including 56 sheets of metal roofing. Rafters and framing were made of native lumber.

An attractive feature of the completed building is low maintenance cost. Concrete walls were "broomed" and no painting will be required. Eventually, the metal roof will need painting, may even be replaced.

After slabs are set into position they are held in place by 2- by 4-inch plates on top. In this structure concrete was poured around the walls level with the surface of the ground.

Construction of the building was planned by Ralph Ricketts, Extension agricultural engineer, and Fred Venrick of the Portland Cement Association, both of Columbia.

No plans are yet available for this building as this was a test structure.

Hybrid Lambs Have Greater Vitality, Give More Meat and Wool

Hybrid lambs that far outclass the finest strains of purebreds in meat and wool production and reduced death rates hold promise for the nation's sheep industry, reports the U. S. Department of Agriculture.

At the USDA Agricultural Research Center, Beltsville, Md., two-way and three-way crosses of purebred Hampshires, Shropshires, Southdowns, and Merinos have outperformed parent stock in practically every factor important to sheep producers.

Three-way crossing, introducing Merino blood into the crossbreds to emphasize production of high-quality wool, was begun in 1951. The three-way-cross lambs show even greater general superiority, but Beltsville scientists feel that 4 years of breeding and testing are insufficient to give a true picture.

The experimental work at Beltsville is continuing. It is based on the use of purebred flocks, improved over the years until they have a fixed, high ability to produce meat and wool. The scientists emphasize the importance of maintaining purebred flocks of highest quality and efficiency for successful use either in pure breeding or commercial crossbreeding. *Wyoming Extension*

How To Get Out Of A Farm Fire Alive

Every member of your family should know what to do in case of a fire. This article may save a life . . .

Condensed from Farm Journal

Edward D. Fales, Jr.

DO YOU know what object in your home will shield you for five minutes against the fiercest fire?

It's your *bedroom door.*

Do you know the most treacherous area?

It's your *stairway.*

Do you know one of the smartest things you can do *now*—before you have a fire?

Have a real *family fire drill,* strange as the idea may seem to you at first.

Not many know these facts, yet most U.S. families some day have to call the fire department. That's why the nation's fire experts say that you—and every family—should have a fire drill every three months.

Many times a winter you read, "Family trapped in fire." That should never happen, yet it does because (1) parents don't discuss with children specifically what to do if fire breaks out, and (2) don't keep ready two or three simple pieces of equipment that will let even small children escape.

Your best insurance for safety, firemen say, is a two-part fire drill: (1) a discussion of facts your children should know; (2) a tour of your house—and a practice evacuation.

Would *your* children know that a bedroom door is often the key to escaping unharmed? Few adults know this, but Robert S. Moulton, fire expert, says: "The flimsiest door ever built will hold back fire for 5 minutes." (One exception: a glass door, which may break.) Moulton is "technical secretary" of the National Fire Protective Association and knows as much about fires as any man in the country.

Would your family panic? In a recent fire a father rushed back in the house to save furniture, emerged with what he had risked his life to save: *a pen and a bottle of ink!* When fire

Reprinted by permission from Farm Journal, Philadelphia, Pennsylvania

starts, strange things happen. Your mouth may suddenly feel filled with cotton—from terrific fear. You may be unable to think or talk. You may tremble or cry.

Unless—say fire experts—you have *practiced what to do.* If you've had family drills, you aren't caught in a battle without a battle plan. And you aren't apt to do the senseless things that turn a minor blaze into a disaster.

"The trouble is: Nobody in the family has been *trained,*" says Moulton. "No one has been given the responsibility of calling the fire department. Family and neighbors run around in complete confusion."

Sit down tonight with your family and plan your first fire drill.

Don't make it a grim session. Rather, make it a game. Talk in easy, non-frightening terms. With young children, keep your tone pleasant, matter-of-fact.

First, elect a Family Fire Chief and Deputy. The first job will probably fall to Dad. The Deputy may be Mother, or a teenage son.

Not many families have the remotest idea about what is dangerous in a fire. So, after your "elections," explain that the *greatest danger is not the flames* at all. Few people are ever burned by flames.

The biggest danger is carbon monoxide and hot fumes that scorch your lungs in an instant. It only takes one or two whiffs.

When you've explained this, write down:

RULE 1: *To avoid breathing fire fumes, get out of your house —fast! Don't stay to fight the fire.*

Explain that these invisible fumes travel faster than fire—much faster. Further explain that a small fire smouldering in a closed room may not appear crucial. But suddenly the air reaches "flashover" heat. At this point—WHOOM! — what firemen call a "burst."

A burst may sweep through a house in seconds. That's why the family should learn:

RULE 2: *Never go back into the house and risk being trapped by a "burst."*

Now take your family on a tour of the house and discuss where fires might start—and where they'd spread.

Furnace fires usually come up the stairs.

Fire in a wastebasket might fill the living room and flash upstairs in a two-story house.

A chimney fire might ignite an upstairs room, the attic or the roof.

Point out that fire *below* you is

always more dangerous than fire *above.*

RULE 3: *Have a meeting place agreed on.* The saddest story of all is of the mother or father who dies trying to rescue a child who is already outside.

Now actually practice leaving your house. You may think this drill unnecessary. But suppose you're asleep and fire rushes up a central hall separating you from the children. How will they get out?

Teach them about the 5-minute protection a closed door gives. In those precious 5 minutes they can get out if they keep their heads. Or they can wait until Mother and Dad get to them.

In most homes the key to escape is still the central hall. If there's no heat or smoke in it, get everybody out of all rooms in a few seconds. *Don't wait to dress anybody!* A "burst" may come in a split second.

If your door has been closed, don't open it until you feel it, or hot gases may blast in and you won't be able to push it shut.

If the door is hot, *leave it closed.* You'll never get out that way!

If it's not hot, brace your foot against the door and open it an inch or two. Get your spouse to help you brace it. If there's smoke or fire, shout across the hall and slam the door. If smoke comes through, stuff a rug against the lower crack.

After you've discussed all this with your family, stress one point. Small children instinctively try to run through the hall to get to you. Teach them how to check their own door, and if it's hot tell them *never to venture into the hall.*

Equip every room so children can get out the window safely, and teach them how. If for any reason they can't get out, teach them to *keep their heads outside the window,* call for help and wait to be rescued. In case the window sticks, show them how to smash glass with a shoe or book, pounding out all jagged edges.

In your fire drills you should test all windows to make sure they can be opened easily.

In your drill, determine what means of escape you do, or don't have. These may be:

- A porch roof below your window (the best fire escape of all).
- A *strong* trellis. (Don't depend on a flimsy one, though.)
- A rope or chain ladder.
- A knotted rope.
- A rope of knotted sheets or blankets.

Whatever the means, you must know how to use it. Practice making a rope of sheets with knots that won't pull out. *Keep a knotted rope in every bedroom closet* and decide where to tie

it! (A flimsy wood bedpost might break). What a simple precaution this is, and how many lives it would save. Why not do something about it—this week?

If you have one of the new rope ladders, you'll probably have a permanent cleat or hook affixed to your window sill. Practice throwing your ladder out the window, or when crisis comes, you might forget to attach it.

If there's a roof below your windows, decide how to use it. How will you get from roof to ground? Is there a tree or trellis? Or shrubs into which you could jump? Will that roof permit you to reach your children's rooms quickly?

Suppose it doesn't but you've reached ground safely yourself. Now, how are you going to get to your children's windows? *Keep a ladder handy!* It should be outside the house: in a garage or car port, perhaps. Many a child has perished in an upstairs room simply because no one could find a ladder in time.

Once you've toured your house with your family, now is the time to learn:

RULE 4: *Know your fire department's phone number by heart!*

Practice over and over again until everyone knows it.

Many Dairy Cows Are Liabilities

Ten to 20 per cent of cows milked on some dairy farms are a definite liability to their owners, reports G. A. Williams, Purdue University extension dairyman.

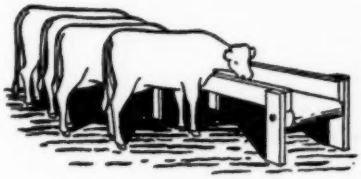
Williams uses one herd of 15 cows on test a full year to illustrate this point. The top five cows in the herd averaged 8451 pounds of milk, consumed feed valued at $116, and left the herd owner $225 per cow above feed cost.

Five cows averaged 7183 pounds of milk and received $105 worth of feed. Income over cost of feed was only $176 per cow.

The five poorest cows in the herd were the money loosers. Their average production per cow was 4751 pounds but their feed cost was $99, leaving only $93 over feed cost to pay all expenses other than feed. Since feed usually amounts to about the same figure as all other production costs combined, the dairyman paid $6 per cow—or an average rental of $.50 per stall each month—for the privilege of feeding, milking, and owning these five animals.

—Indiana Extension

A Prefabricated Plywood Loafing Barn



This new barn on a Canadian farm may usher in a new type of construction for farm buildings . . .

Condensed from The Country Guide

C. V. Faulknor

ABOUT nine o'clock one morning last fall, Sid Thompson, a farmer near Bentley, Alberta, Canada, heard a heavy truck toiling up the steep hill by his place. In a few minutes the big trailer job pulled into the yard, followed by a smaller truck carrying tools, nails, and a gang of men. His new barn had arrived right on schedule.

Sid opened the gate, and led the way to the spot where he'd finished digging about 14 holes the day before, each from four to five feet deep. Then he stepped back, and watched the 32 by 64-foot prefabricated loafing barn take shape before his eyes, perhaps not too conscious of the fact that he might be pioneering a new era of farm building practices.

By nightfall, the walls and rafters were up, and the walls painted. Two days later the job was finished and Sid was tossing bedding in, ready for his cows. That's a fast piece of work when you consider a hog house on the same farm took a carpenter and helper all summer to build. But it was by no means a record for prefabricated buildings. Being the first one of its type, there were a few bugs to iron out, such as having to pour cement footings in the holes, because of the soil type. Also, in future, all parts will probably be prefabricated in the factory. Given a little time to perfect the process, it is expected that the same type of barn will be erected by six men in one day, or even less.

Sid Thompson's barn is the result of an idea, put forward by Merrill Muttart, Edmonton industrialist, that the principles of prefabricated housing could be applied successfully to farm buildings. He assigned research engineer Gil Rekken to look into the matter. The first thing Rekken did was visit the universities, experimental farms, and various agricultural extension groups to learn the types of farm structure

Reprinted by permission from The Country Guide, Winnipeg 2, Manitoba, Canada

now being recommended for the western prairies.

"I found that a new concept of housing livestock has gained the backing of these people who are in the know," Rekken stated, "and that is the principle of housing. It's no longer recommended that animals be tied up in their quarters. They get too dirty that way, and blood circulation is restricted, which reduces the animal's ability to produce heat. We decided that if we were going to apply our prefabrication methods to farm buildings, we'd confine ourselves to the new types—conventional barns appear to be on the way out."

Total stocks of 83.5 million tons of feed grains on farms January 1, 1956, were the second largest January stocks on record, only 6 per cent below January, 1949, according to the Crop Reporting Board.

C. A. Cheshire, extension engineer for the Alberta Department of Agriculture, Edmonton, puts it this way: "Stanchion barns are a symbol of yesterday. Some farmers still build them, of course, but mainly because they *look* like a barn. But believe me, they're a mighty costly showpiece. Just compare these costs: The older type barns range from $250 to $600 per animal, while loose-housing units run from $125 to $250 per animal. Now that we can pressure-treat poles to last 50 years, the pole barn is the answer to rising costs."

When queried about prefabricated farm structures, Cheshire had this to say, "I think we'll see more and more of this trend as time goes on; and that applies to farm dwellings too. That way the farmer only buys the material he uses, and no special labor or equipment is involved."

It was as a result of checking with his agricultural engineering service that Sid Thompson got the idea of trying a prefabricated barn. It is a trussed-roof, pole-type cattle shed, with no poles in the floor area to restrict stock movement, or interfere with manure removal. In place of the open side, there is a fourth wall, containing a removable door of rough siding. Roof trusses, placed at four-foot intervals, are able to carry a tremendous load over and above the normal demands of the structure. Made of light, strong wood, such as spruce, they have shown only a slight deflection when tested under weights up to 135 pounds to the square foot. To most Canadian farmers, who must consider the demands of heavy winter snowfall, this means that the truss beams could safely carry five feet of snow over the entire roof.

The poles, which have a diameter of six inches at the top and represent the foundation of the building, are sunk in the ground four to five feet. That way they remain rigid and the structure doesn't need any cross-bracing. Splash boards of heavy planking are nailed along the poles at the bottom, to a height of four feet, to take the build-up of manure. Both poles and boards are pressure-treated in a chemical bath, to make them resistant to insects and rot.

The loafing barn walls consist of reinforced plywood panels from 12 to 16 feet long, with a honeycomb, bridge-like construction. These are assembled in sections at the factory, from pre-cut lumber. No feed racks for this type of structure have been made to date, but they are a distinct possibility for the farmer who buys the package barn of the future. For roof sections, there's a choice of treated plywood, plywood covered with a roofing material, as on the Thompson unit, or aluminum panels.

Cost of the building will vary a good deal with the type, and the material chosen, but an open-housing unit on the Thompson pattern comes to less than one dollar per square foot. On the recommended basis of 50 sq. ft. per cow, this unit would house some 40 head, at an over-all cost of about $50 per cow. Even with all the extras thrown in, it would be safe to count on housing your stock in a prefabricated unit for less than $100 an animal, which is well below the minimum loose-housing structure costs.

"I figure it cost me about one-third the price of a regular barn," Sid Thompson said. "There's no haymow needed, and no cement floor. Maybe I'll use a bit more bedding in this loose-housing type, but my cows will be cleaner, and there won't be nearly as much work."

Just about every type of modern farm building lends itself to prefabrication — loafing barns, hog houses, granaries, machine sheds, and dwellings, to name but a few. Lumber can be pre-cut in factories for cattle stocks, self-feeders, breeding racks, feed gates, and a host of other uses. From here, it looks like another time and money saver, which will increase production efficiency for those who make their living down on the farm.

The kinds and amounts of fertilizer that are used need to be tailored to fit the farmer as well as the farm. Farmers vary in the amount of cash they have available for spending as well as in their willingness to take risks.

How To Produce Better Hatching Eggs

Pointers which may be of special help to those producing hatching eggs for broiler chicks . . .

Condensed from
Everybodys Poultry Magazine
Harvey W. Taylor

WHEN considering the management of broiler strain hatching egg flocks, it is necessary to recognize certain fundamental differences between those flocks and market egg flocks.

Obviously, both need sufficient air, feed, water, floor space and light. In both cases, good housekeeping must be practiced in maintaining all equipment in clean workable condition; chores must be done on regular schedules; accurate daily records must be kept; birds out of condition must be removed as soon as observed and constant vigilance must be maintained for signs of disease or parasite invasion.

When specific recommendations are considered, however, we encounter special needs for the broiler strain breeding flocks.

Different Equipment Necessary

Since breeding flocks are maintained for the purpose of producing eggs with a high degree of fertility and hatchability, we must keep both the males and the females in the best possible condition. Equipment that is adequate for an all female market egg flock may not be suitable for a breeding flock since often the males are reluctant to eat from feeders or drink from waterers with grills or closely spaced reels. It may be necessary to install special cockerel feeders in order to insure adequate nutrition for the males. If the reels or grills on the watering equipment seem to bother the cockerels, they may have to be opened up.

Another factor which concerns the male birds is the possibility of frozen combs or wattles. In most cases this can be avoided by providing proper ventilation since frosting occurs when cold. In areas where extremely low temperatures are to be expected the safest thing to do is dub the combs and wattles of the males when they are young.

Good egg production can be maintained in the new multiple roost houses with light breeds. These houses allow only one

Reprinted by permission from Everybodys Poultry Magazine, Hanover, Penna.

square foot of floor space per bird. It is generally agreed however, that the heavy broiler strain breeds need from three and one-half to four square feet of floor space per bird.

Keep the Litter Dry

A dry litter will pay big dividends because the more activity there is the better the performance will be. Wet, caked, and cold floors certainly do not contribute to good hatchability or to good egg production; also, most of the floor eggs produced under such conditions are too badly soiled to be suitable for hatching. The best way to maintain a satisfactory floor condition in the pens is to start with clean litter, not too deep at first. Remove all caked spots when they occur and keep adding small amounts of fresh litter from time to time as the season advances.

Feed some hard grains of small particle size scattered widely in the litter. This encourages scratching which not only helps to maintain the flocks in good physical condition but also is the best way to keep the litter stirred. In some sections where cheap coal is available there has been some use of supplemental heat in the breeding pens in severely cold weather. Production and hatchability was improved largely because the birds were more active since they were more comfortable.

Gather Eggs Often

Since low temperature adversely affects hatchability, it is good practice to collect eggs frequently in the winter time. This is especially necessary when the roll-away type of nest is used. Exposing warm eggs directly from the nest to below freezing temperatures even for a short time can lower the hatchability, therefore the eggs should be taken to the egg room as soon as collected.

The Right Kind of Egg Room

Much has been said and written about egg room temperatures with most of the emphasis being placed on the necessity for keeping the eggs cool during hot weather. On the other hand, the need for keeping them from getting too cold during the winter months has not received much publicity. Many cellars and egg rooms will drop below desired levels during prolonged cold spells, resulting in poor hatches of eggs held through such periods. Hatching egg room temperatures should not fall below 55 degrees at any time. An average of 60 degrees is still better.

Cased eggs that are to be used for hatching should not be kept directly on the floor in cold weather. Make a row of empty

cases and store the filled cases on top of them, or on shelves. As a rule most egg rooms are too dry, especially in winter. Provide sufficient humidity so that the egg cases and fillers are slightly pliable to the touch, not "cracker dry."

Provide a 14-Hour Day

The use of artificial light in the breeding pens is a necessary winter time management practice. Since we are interested in obtaining pituitary stimulation as well as in maintaining a 14 hour day, be sure that you have sufficient brilliancy, at least one watt per bird, with clear glass bulbs preferred. Wipe the dust off as it accumulates. Also remember to keep the windows clean so that the flock can receive the full benefit from bright natural light on sunny days.

Don't Skimp on Water

Many flockowners provide extra water in the laying pens during hot weather. There is an increasing awareness that this extra water space is also a good thing to have during cold weather. You cannot expect top performance from a broiler strain breeding flock if you have less than one inch per bird of water space or with less than six inches per bird of feeder space. These big birds are going to eat in the neighborhood of 20 per cent more feed per day than the light breeds do. Therefore optimum water and feeder space must be provided for a successful operation.

Extra attention to the management matters discussed here will help to achieve profitable production of superior quality hatching eggs throughout the winter months. In addition, this extra care should also bring the flock into the spring months in top condition, so that maximum benefits will be derived from the natural stimulation that comes at that time.

The flockowner should at all times be conscious of the fact that in a hatching egg operation one of his most important jobs is to protect the viability of the embryos in the eggs produced by the breeding flocks.

A flying rancher landed his plane on a field near Denver, got out and said to a well-dressed man standing nearby, "Say bud, keep an eye on my machine, will you?"

The man affronted replied, "I'll have you know I'm a U. S. Senator."

"Well, what if you are," said the rancher, "I'll trust you!"

Getting More Food Value From Alfalfa

Recent research brings to light some interesting facts about the feeding value of alfalfa . . .

Condensed from California Farmer

LIGNIN, as found in alfalfa in varying amounts, is not only indigestible but keeps other nutrients from being available to the micro-organisms of the rumen, according to J. H. Meyer, assistant professor of animal husbandry at the University of California. Information on University tests was included in a recent report and substantiates information from investigations at other stations.

In tests with rats fed fiber fractions isolated from alfalfa (including mainly cellulose, hemicellulose, lignin and a soluble fraction) it was found that lignin was not utilized at all in these simple-stomach animals. Holocellulose was shown to be a poor energy source and did not support weight gains.

The soluble fraction of alfalfa was found to be the primary energy source for animals and also a good protein source. The indication from the tests then, said Meyer, was that if alfalfa is to be utilized as an energy source for simple-stomached animals, it is important that the alfalfa be very low in fiber and high in soluble constituents.

"Alfalfa's main importance for ruminants is as a source of energy, and here again the fiber components influence this to the great degree," said Meyer. Work in the laboratory with an artificial rumen containing micro-organisms removed from live sheep showed that a roughage such as safflower hulls could not be digested by the micro-organisms. But when the lignin was removed, a 150 per cent increase in digestion of the hulls was possible. This confirms the contention that ". . . lignin, itself, is not only indigestible but renders other nutrients unavailable to micro-organisms of the rumen."

In fact, by using the lignin content of the fiber, the TDN in roughage can be predicted with r e a s o n a b l e accuracy, Meyer pointed out. A further compli-

Reprinted by permission from California Farmer, San Francisco 5, California

cating factor, however, is that the placement of lignin in the plant stem and leaf varies with plant species and might well be expected to influence digestibility differently depending on how the lignin was laid down.

More important, however, are the facts of change in composition in the alfalfa plant during different stages of growth. "It was found that protein decreased from 30 per cent at the early pre-bud stage to 17 per cent at full bloom," said Meyer. "Crude fiber increased from 15 per cent to 30 per cent during this same period while lignin increased from 5.2 per cent to 8.4 per cent. The change in lignin did not follow the same pattern as that of crude fiber since it tended to level off at 10 per cent bloom while the crude fiber continued to increase.

A thifty old Yankee, when told that an industrial tycoon had left a fortune upward of $100 million, commented:

"One hundred million dollars? My, he must have had an awful savin' woman."

Digestibility studies indicated that TDN levels were very high when alfalfa was cut in the pre-bud or bud stage and decreased quite rapidly. However, the total yield of nutrients on an acre basis does not seem to reach its maximum unless the hay is cut at the 10 per cent bloom stage. More research is needed to ascertain if certain cuttings of extremely high quality alfalfa can be made to keep the total yield at somewhere near maximum."

Digestibility does not tell the whole story, however, in the proper evaluation of alfalfa fed as pasture, silage (green forage) or hay, said Meyer. "Other experiments have shown that digestibility of alfalfas can vary to a small extent and still show very great differences in their influence on weight gains of steers.

"For example, it was found that the TDN of alfalfa fed green was 55.4 but the same green alfalfa when harvested as hay and fed to steers had a TDN of 54.9. However, the animals gained 16.6 pounds for every 100 pounds of TDN from the hay.

By the time most folks learn to behave themselves, they are too old to do anything else.

"In the same study it was found that animals grazing on pasture gained 23 pounds per 100 pounds of TDN intake . . . The variation in value of TDN indicates the possibility that some other measure such as net energy might more properly evaluate roughages of varying quality," Meyer concluded.

Virginia's Beef Cattle Improvement Association

What one state is doing to encourage production testing of beef cattle . . .

Condensed from Virginia Angus Topics

C. C. Mast, Virginia Polytechnic Institute

I HAVE been asked on many occasions what is the Virginia Beef Cattle Improvement Association? What is it all about? Are you fellows recommending trying to grow them as big as possible, these big horsey kind of cattle that can step across a fence? If you are just talking about weight for age, why a Holstein will do as well as anything else.

No, that's not what we are talking about, purely of good type and weight. As the president of the Virginia Aberdeen-Angus Association so ably stated at the annual meeting, one of the primary needs of the breed now is to develop more and better bulls and find more and better markets for those bulls.

Now that statement is most certainly true, and when we say that, we mean that we are going out for the commercial cattleman's business. And what does the commercial cattleman want? Well, he wants good type cattle that grow fast—it is just as simple as that, because when he takes his cattle to market, he gets paid for two things—he gets paid for quality, and he gets paid for weight. The commercial cattleman cannot get along these days by having just one of these factors.

Figuring up on last year's Virginia Feeder Calf Sales, I find that a medium calf which gained two pounds a day was worth exactly the same thing at sale time as a fancy calf which gained a pound and a half a day. But, on the other hand, a fancy calf which gained two pounds a day was worth more than the medium calf which gained two pounds a day. So there are the cold facts —and we can't possibly go out here and breed cattle for just type and forget all about weight at the same time. We must keep

Reprinted by permission from Virginia Angus Topics

in mind when breeding purebred cattle that regardless of what we intend to do with them, all of them sometime must reckon with the butcher's block.

I am not certain whether anybody knows whether a mature bull should weigh a ton or whether he should weigh 1600 pounds. There is an abundance of evidence that indicates that some of these medium size mature cattle grow as rapidly to 1,000 or 1,200 pounds as some of the cattle which mature out at larger sizes. However, we will all have to agree that how rapidly a steer will get to 1,000 or 1,200 pounds is of utmost importance. Certainly, it is not the long-legged, slab-sided types of cattle that we want, nor do we want the rolly-polly, doll-baby type that attracted so much attention several years ago, but instead, the typy kind of an animal that grows fast. We have found in our feeding work at the Front Royal Experiment Station that there are plenty of cattle of all types which do grow rapidly, and there are plenty of all types which grow slowly. So pick the right type, that does grow rapidly, and you will be back on the right track, we think.

Now, to illustrate what our Beef Cattle Improvement Association can do for a breeder, let me review the work for the past year. There were a total of 26 farms enrolled, with a total of 812 calves. The average adjusted daily gain of all the 812 calves in this program was 1.81 pounds per day. The average grade was low choice, and the average index for the calves was 115.

Now, let me explain what these figures represent. First, when a farm enrolls in the program, it receives cards to fill out as the calves are born. The producer weighs the calf at birth, or measures its heart girth from which we compute weights, puts down the sire and dam of the calf, and its birth date. The card is then forwarded to Dr. T. J. Marlowe, who is now the executive secretary of this program, at Blacksburg, Virginia, and he enters the card in the records. Incidentally, we are using IBM records for this program. At weaning time, Dr. Marlowe visits the farm and weighs each individual calf. A professional grader accompanies him and puts a grade on each individual calf as it is weighed. Each calf is graded as fancy, choice, good, or medium, and is designated as high or low in the grade, such as choice plus or choice minus.

Since all of these grades have to be averaged for all the calves on a given farm, it has been necessary to apply a numerical rating for the grade, and for that purpose we use 16 for fancy, 13 for choice, and 10 for good grade,

adding one or subtracting one depending on whether the animal happens to be in the upper third or the lower third of the grade. The index number is an overall value applied to the animal, taking into consideration both type and rate of gain, with each given equal value. At the end of the year, a report is sent to the producer in the program showing the performance of each individual calf and the average of all calves sired by each individual bull. A list of all farms cooperating in the program is sent to each producer, listing the overall ages of all farms participating. In this report, however, farm names are not used, but instead numbers are applied to the farms, thereby keeping the farms anonymous on the overall state report. Each participant knows what his own code number is.

There are about three ways that this program will help a cattle producer. First, and the least important, it gives him a means of comparing his own results with those of other farms. Due to different environmental conditions and management practices, this does not give a true picture by any means, but at least, if the farmer finds himself down on the bottom of the list he knows there are a number of things that he can do in order to improve himself. This is the only means that a producer has of comparing the performance of his cattle with other producers.

CHART I

Farm	Calves	Av. Daily Gain	Av. Grade	Index
1	24	1.83	14.4	127
2	38	2.02	11.1	119
3	73	1.73	13.1	117
4	27	1.54	11.3	101
State Av.		1.81	12.2	115

As an example, let's look at Chart 1. You will notice that farm No. 1 had 24 calves entered. They had an average adjusted daily gain of 1.83 pounds per day and an average grade of 14.4 or an index of 127. This particular producer knows that he is doing a pretty good job in that he has cattle that are average with the total in rate of gain and he is way above the average in grade and total index. Even though he is at the top, he can see at a glance that he can still make some improvement in the rate of gain. Now if we look at the No. 4 farm, which is at the bottom of the list, we can see that his 27 calves had an average grade of 11.3, or an average index of 101. This producer can see that he is way below the state average on rate of gain and type of his cattle and that he can make a big improvement both ways and should do so.

The second and probably most

important phase of this program is that it gives a means of comparing the bulls on any given farm. Environmental and management conditions on any one farm will be about the same for all cattle; therefore, we can usually assume that all bulls on a given farm do have an equal chance. Let's study the three farms on the next chart and we can quickly see what this program can mean to a breeder. Starting from No. A, we will notice that bull 37 last year sired 16 calves which had an average daily gain of 1.45, an average grade of 10.6 and an index of 93. Bull 21 sired 24 calves; their average adjusted daily gain was 2 pounds per day with an average grade of 13.8 and an index of 131. Bull 45 was a young bull which was just being tried and he had sired 4 calves. Their adjusted average daily gain 2.57, their average grade was 13.8 with an index of 154. Needless to say, this cattleman quickly discarded Bull 37 because he was good neither from a standpoint of gain or type, or at least his progeny was not even though the bull himself was an excellent appearing bull. The producer was quite happy with Bull 21 in that he was siring cattle which had a combination of excellent type and fast rate of gain, and needless to say, he was highly elated over the first four calves produced by Bull 45, although he knew that this was too few calves to draw a final conclusion and that the bull would have to be tested further.

The third benefit to the cattlemen participating in this program is the excellent record he has for culling cows. To illustrate this point, I have chosen six cows from the record of a farm which did have excellent type cattle. You will see on Chart No. 3 that Cow No. 14 produced a calf which had an adjusted weight of 2.06 pounds a day with a grade of 14 or an index of 136. Cow No. 13 on the other hand, produced a calf which was lower in grade and very much lower in rate of gain, in fact the rate of gain is low enough that that particular animal would

CHART II

Farm A Bull	No. Calves	Adj. Av. Daily Gain	Av. Grade	Index
37	16	1.45	10.6	93
21	24	2.00	13.8	131
45	4	2.57	13.8	154

have no place in a commercial herd and therefore should most certainly have no place in a purebred herd.

Looking at Cow 23, we see that her calf graded as high as the calf of Cow 14, but its rate of gain was only 1.49 pounds per day. This is the cute little doll baby kind of calf which most certainly we should cull out. When we look at the calf produced by Cow 54, we see that it was a very high grading calf and also was above the average in rate of gain. There again, this is the kind of cattle that the commercial people need. Cow 213 had produced a top quality calf but a calf with only a rate of gain of 1.59, and certainly the commercial producer cannot make any money with that kind of cattle; and therefore, it has no business in a purebred herd. Cow 693 on the other hand, produced a calf which had a rate of gain above the average and a calf which graded well above the average, and would be a satisfactory animal in most any herd.

Now, naturally a man would not want to cull his cows on the basis of a one year record, but after he has been in the program for two years, from then on he will have records adequate to cull his cows, and certainly there are no better records than these by which a culling job can be done. If the cows on this chart repeated the second year the same as the records indicate the first year, then I would say that what this particular cattleman should be keeping in his herd are cows like 14, 54 and 693, because they are the cows that are producing cattle that are of excellent type and do have good rates of gain. The other three cows, while the grades of their calves are satisfactory, their rates of gain are too low to be satisfactory for a commercial producer to use.

CHART III

Farm D: Cow No.	Calf No.	Adj. Wt.	Grade	Index
14	5113	2.06	14	136
13	6965	1.64	13	112
23	1891	1.49	14	111
54	918	1.87	16	136
213	5908	1.59	15	120
693	5315	1.85	14	126

I have often heard it stated

that some particular bull was a wonderful show animal, but would not be a good commercial bull. I contend that there is no such animal. In order to be a good show animal, first he must be a good commercial animal because that's what a beef animal is for. This program is designed to assist the producer in selecting those cattle on his farm which are producing the cattle which possess those qualities of type which go towards making the animal profitable. There is no such thing as a truly excellent animal which does not produce both qualities these days.

In this Beef Cattle Improvement Association, we are not hunting for long legged cattle which grow rapidly, but instead we are hunting for those cattle which do possess good type and good growth characteristics, and I think the above charts do demonstrate to you that such cattle do exist in our herds today.

Rats Can Perform Amazing Acts

A rat is a good acrobat.

John M. Amos, Virginia entomologist, has been compiling some facts on the amazing feats performed by rats, with the aim of letting farmers know what they're up against when it comes to rat control.

It seems: A rat can walk along horizontal wires and cables. It is possible for a rat to climb a vertical wall of concrete blocks or rough brick. He can climb a rusty vertical pipe with a 1½ to 4 inch inside diameter. He can reach 13 inches vertically, so a reaching distance of 18 inches is used for ratproofing. A rat can jump 2 feet vertically from a standing position, and more than 3 feet with a short running start.

From a standing position, a rat can jump 4 feet horizontally. From a height of 15 feet he can jump 8 feet horizontally. He can enter a building by dropping two or three stories through a skylight, and live to tell the tale. A rat is a good swimmer and can enter a building through water seals in the plumbing. When trying to burrow under a wall, a rat will dig to intersect the wall face about 18 inches below the ground level. As he goes deeper along the wall, he will stop burrowing if he comes in contact with an object in the horizontal plane, such as the ledge formed by the footing.

A rat can gnaw through any material that is softer than his teeth provided he can find a hole that is ½ inch in diameter or larger, or can start one with his claws.

Virginia Polytechnic Institute

A New Southern Forage Crop

The cross between sorghum and Johnson grass offers exciting possibilities for southern farmers . . .

Condensed from Texas Livestock Journal

NEW forage crop plants—crosses of sorghum and Johnson grass growing to 18 feet and yielding more than 30 tons an acre—are being developed by the U.S. Department of Agriculture and Mississippi Experiment Station at State College, Miss.

Now under field evaluation tests before possible release, the new plants promise increased opportunity for livestock production and diversified agriculture in the South.

Selected from about 34,000 original progeny, the segregates under test represent those found most palatable to cattle, sheep, hogs and mules. Three basic types have been developed—one resembling sorghum, another resembling Johnson grass, the third an intermediate type.

The new varieties combine the valuable feed carbohydrates of sorghum and the perennial habit of Johnson grass. This was the big goal sought by agronomist H. W. Bennett and his associates eight years ago when the project was little more than an idea.

Similarity between the sorghum and Johnson grass ends with the fact that both belong to the grass family. Sorghum is an annual having 10 pairs of chromosomes, Johnson grass a perennial having 20 pairs. (Chromosomes are microscopic cell bodies that control development of plant character and are the carriers of inheritance.) Crossing plants of the same species is a relatively simple matter if chromosome numbers are equal. If they are not equal, the task is difficult—often impossible.

Bennett's sorghum - Johnson grass hybrids were produced by hot-water emasculation, followed by pollination. The sorghum (Hodo) heads were trimmed, leaving florets that would bloom next day. These florets were immersed for 10 minutes in water at 47 degrees centigrade. Johnson grass pollen was dusted on the florets for the next three days. Crosses haven't been produced using Johnson grass as female parent.

Palatability tests followed, since there was little reason to

Reprinted by permission from Texas Livestock Journal, San Antonio, Texas

produce a forage plant that livestock wouldn't eat. With 2,600 different types of F2 plants from which to choose, Bennett selected many from what he thought may be "the cow's viewpoint." These he tagged. The cows ignored them. He let the cows choose.

American living standards in terms of volume of goods and services purchased per person have risen 50 per cent in the last 15 years.

They picked 115 plants out of the group and showed their appreciation in three trials by eating stalks and all. With this information right out of the cows' mouths, Bennett selected — as the cows had—those plants that had juicy, succulent stalks.

Researchers wanted to retain the all-important perennial habit of Johnson grass in the new plants. This meant concentrating their efforts on the Johnson grass rhizome that the hybrids had inherited. Progenies of the hybrids were used in attempts to select those having the perennial habit. The progeny segregated into approximately 75 per cent with rhizomes, 25 per cent without them. Out of the selections, however, came a number of perennial types that were hardy enough to stand the winter temperatures in Mississippi as low as minus three degrees F.

There was still another problem. Sorghum grows from seed, Johnson grass either from seed or vegetatively from its rhizomes. The rhizomes wander through the soil in all directions from the parent plant and send up new shoots of grass. Careful selection made it possible to obtain types with more compact rhizomes. The results were plants that grew compactly above and below ground. One of them, for example, has produced 32 tons of forage each of the last four years in plantings spaced six feet each way. Grass types have produced as much as 14 tons an acre—three tons above the average yield of silage crops in Mississippi.

The new plants have many advantages. They grow during August and September in the South when little else grows. They provide high quality grazing or silage. Even in hot weather, the yield should support up to eight cows an acre. With a small amount of concentrate — cottonseed meal, for example — they should provide low-cost, balanced rations for livestock.

Field tests being made this year will determine the degree of adaptability the selections have attained. If the tests of the three types prove successful, releases of at least some may be expected as soon as seed supplies are available.

Tests Show that Sows Need Roughage

The need for roughages in the ration of the brood sow has been proven by tests at several mid-west Experiment Stations.

Condensed from The Southern Planter

COSTS of the newly farrowed pig can be reduced one-third if producers will use good-quality bulky feeds such as oats, alfalfa or silage as the major part of the sow's gestation ration, according to studies at Iowa State College.

The cost of a pig at farrowing time is influenced by two main factors (1) the cost of the ration and (2) the number of live pigs farrowed.

If there has been one fault with the usual practice of feeding sows it is that they have been fed too well, so as to become fat. Fat sows do not do as well, as a rule, at farrowing time as the thinner ones.

The Illinois experiment station completed an experiment with a ration consisting of 750 pounds corn, 194 pounds of 44 per cent protein soybean oilmeal, 25 pounds of dehydrated alfalfa, 1.2 pounds of B vitamin supplement, 2 pounds of ground limestone, 10 pounds of steamed bone meal and 5 pounds of mineralized salt.

The researchers fed this ration to separate lots of sows and gilts at rates of 3 pounds daily, 4½ pounds daily and 6 pounds daily; on the basis of pigs farrowed the 4½ pounds daily feed proved most satisfactory.

The Minnesota experiment station recently tried out two practical farm rations, both of which gave good results with pregnant sows and gilts. One consisted of 46 pounds of oats, 45 pounds of alfalfa, 4 pounds tankage, 4 pounds soybean oilmeal, ½ pound bone meal and ½ pound of salt. Ten milligrams of Vitamin B-12 were added to a ton of this feed. The other ration was the same except that corn replaced the oats.

If a swine producer feeding either of these rations would use his own good alfalfa meal from third-cutting alfalfa, well cured, he would be providing a very satisfactory and economical

Reprinted by permission from The Southern Planter, Richmond, Virginia

source of bulk for pregnant sows. These rations were self-fed. The decision as to whether oats, corn or a mixture of both would be used should depend upon supplies and relative costs.

The Iowa, Minnesota, Illinois and Indiana experiment stations have been testing the use of good corn silage as the bulky part of the ration. The silage must be of good quality and be well balanced by a good supplement. The Iowa experiments have shown that pregnant sows fed as much as 12 pounds of good 60-bushel corn silage daily plus 3½ pounds each of a 20 per cent protein supplement produce satisfactory results in size of litter and strength of pigs.

Ewes Need Grain and Roughage in Winter

Good grass or corn silage may be used to winter pregnant ewes if there is not enough pasture, says Ivan Watson, extension animal husbandman at New Mexico A. & M. College.

"Eight to 12 pounds daily is the recommended allowance per head. However, it is better to include at least a pound of dry roughage in the ration in place of 2½ to 3 pounds of silage," Watson says. "Do not feed moldy or frozen silage because either tends to cause digestive disturbances in pregnant ewes."

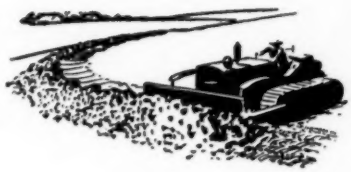
After winter grazing is no longer available, adequate roughage plus a half-pound of grain per ewe daily should be fed before lambing and a pound after lambing until spring pasture becomes available.

With grass silage the grain can be shelled corn, small grain or a mixture of grains, the animal husbandman explains. The same grain can be used with corn silage, but a fourth of a pound of protein supplement should be included in the grain mixture.

If silage and other roughages are scarce, Watson says, the grain allowances may be increased gradually to 2 pounds per head daily. For each additional pound of grain fed, approximately 1½ pounds of hay or 4 pounds of silage can be replaced in the ration.

Ewes should have access to salt alone and in addition, a mixture of 3 parts of bonemeal and one part of salt to insure against mineral deficiencies. Ewes should be kept gaining up to lambing time in order to prevent pregnancy disease. This is best done by liberal feeding of grain and good roughage. *Farm, Ranch & Home News*

Drainage You Can See



Surface methods serve well to remove surplus water from farm lands and may mean economy for the farmer . . .

Condensed from
The Rural New Yorker

Elmer W. Gain

TALK to farm people about draining a field or wet spot, and you will probably hear a lot about tile. It has certainly done wonders and will do more on many farms in years to come. But many poorly drained sites are not suited to tile because of too heavy or too shallow soils, not deep enough outlet, or just because a proper tile system costs too much for the type of farming carried on. There is, however, another method of drainage that has hardly been touched. We call it surface drainage. It is done by working and treating the face of the land.

You can see surface drainage operate after rain or a heavy snow melt. It is not expensive in relation to returns from it. And the newer designs are easy to live with: they are made to suit the needs of farm machinery; they take much less space out of production than you would expect; in fact, they have already put thousands of acres into the black for the first time.

Ask a West Almond, N. Y. farmer about diversions across his steep 50-acre field, and he will tell you "within a year after they were installed, the diversions resulted in producing more than 50 bushels of oats per acre on land where there had been no satisfactory crop of oats in the previous 15 years."

Or ask a South Jersey vegetable grower in Atlantic County who the first three years he owned land obtained only one crop. After cutting off seepage and flooding from the uplands with i n t e r c e p t o r and outlet ditches, he was able to state: "I can now cultivate within a day or so after a good rain and can get in and take off more than one crop a year."

Or you could look for more spectacular results to the University of New Hampshire farm where they put a $4,000 bed

Reprinted by permission from The Rural New Yorker, New York City, N. Y.

drainage system in an 80-acre wet spot. University folks will tell you they took $15,000 worth of hay off the field the next two years. The drainage cost was paid off in that time, and they actually stepped $1,000 ahead.

Why Is There Not More Surface Drainage?

With results like that, you may wonder why more farmers have not rushed into drainage programs, surface drainage in particular. Aside from the fact that experienced farmers do not pile headlong into *any* method, some of the drawbacks are probably these: many farms already have old drainage systems—some dating back to the Revolution—and there is a tendency on the part of the farmer to make them do; more often, areas needing treatment are small—a fraction of an acre—and owners feel that they are not worth bothering with; also, startingly little information has been collected to tell just what proper surface drainage can do.

Did you know that a 100-watt bulb produces nearly one and one half times as much light as four 25-watt bulbs, costs the same to operate and about one-third to buy?

In respect to this cost problem, look at a decision recently made by a Saginaw, Michigan, dairyman, who sought the advice of Michigan State College about his farm venture. With limited capital, he chose to accept a recommendation to drain an 80-acre field *first,* before putting more money into his herd, barn, and equipment. His reward was expected to be a doubled annual return above costs, $3,800 on 120 acres. A dairy adjustment would have netted him only $400 more than his previous $1,800 record. And dairy improvements would have cost slightly more than drainage, $9,000 as compared with $8,600.

Drainage can be like that, a key to open doors to a brighter future for the farmer. There is no magic about it, *but where it fits* it pays off steadily through the years, like any other good farming method.

Facts and Features On Facial Drainage

According to recent estimates, surface drainage can improve as much as 22 million acres of soggy farm land in the 12 northeastern states. Here rainfall, rough topography, and heavy or shallow soils invite water-handling at the surface of the ground. Even in the few really large flatlands such as the Coastal Plain and the lake plains of New York State, surface drainage improves crop-

ping results. It can, of course, be tied into subsurface systems.

The features of surface systems — bedding systems, field ditches, diversion terraces, and grass waterways — are all adaptable to northeast farming. The low general range of costs, $20 to $75 an acre compared to up to $300 or more an acre for tile systems, usually appeals to farm-

slope, length, and *area above* as well as *on* a problem field. And so, also, has the kind of vegetation on the watershed. Finally, amounts of drainage water that need to be removed in about a day's time have to be figured correctly. Help on these matters can, of course, be obtained from the soil conservation district, the extension service, or state college

NEW SUBSCRIPTION ORDER FORM

Send FARMER'S DIGEST to me for

☐ 3 Yrs. at $6.50 ☐ 2 Yrs. at $4.50 ☐ 1 Yr. at $2.50

I enclose $_____. ☐ Please bill me.

Name.....

R.F.D. or Street.....

Town and State.....

Canada: $6.80 for Three Years; $4.70 for Two Years; $2.60 for One Year

Mail to—FARMER'S DIGEST, Fort Atkinson, Wisconsin

money, irst for *before* ı prob- ception e fam- ıeir in- ds well, ı, too. placed conser- North- 5,000 hannels

tractor always gets stuck. Not so easy to see are the shallow root systems that die of thirst when drouth comes, or the moisture-induced cold that deadens vitality of soil bacteria.

Usually more difficult is to tell precisely where the water is coming from, why it lingers, and how to get effectively rid of the excess. The particular kind of soil and subsoil on a farm has much to do with drainage. So has

d to USDA that they intend to raise 67 million turkeys in 1956, compared to 63 million in 1955.

in the past 15 years. Farmers found out quickly that diversions helped them to work protected areas a month or more earlier in Spring. During the kind of wet years that previously ruined crops

drainage system in an 80-acre wet spot. University folks will tell you they took $15,000 worth of hay off the field the next two years. The drainage cost was paid off in that time, and they actually stepped $1,000 ahead.

Why Is There Not More Surface Drainage?

With results like that, you may wor
have not
programs

**Did
watt t
one an
much l
bulbs,
erate a
buy?**

particular
that expe
pile head
some of t
ably thes
have old
dating back to the Revolution—and there is a tendency on the part of the farmer to make them do; more often, areas needing treatment are small—a fraction of an acre—and owners feel that they are not worth bothering with; also, startingly little information has been collected to tell just what proper surface drainage can do.

In respect to this cost problem, look at a decision recently made by a Saginaw, Michigan, dairyman, who sought the advice of Michigan State College about his farm venture. With limited capital, he chose to accept a recommendation to drain an 80-acre field *first,* before putting more money into his herd, barn, and equipment. His reward was expected to be a doubled annual

How Much Is Farmer's Digest Worth?

"I enjoy Farmer's Digest and find it so valuable that I would like you to quote me a price on all issues since 1945. I will bind them and have a complete library for reading and reference."

* * *

"One article in Farmer's Digest made me at least a thousand dollars. I can say your magazine is the best investment I ever made."

* * *

"Had I subscribed to your magazine years ago, farming for me would have been much more profitable. I won't be without it again."

According to recent estimates, surface drainage can improve as much as 22 million acres of soggy farm land in the 12 northeastern states. Here rainfall, rough topography, and heavy or shallow soils invite water-handling at the surface of the ground. Even in the few really large flatlands such as the Coastal Plain and the lake plains of New York State, surface drainage improves crop-

ping results. It can, of course, be tied into subsurface systems.

The features of surface systems — bedding systems, field ditches, diversion terraces, and grass waterways — are all adaptable to northeast farming. The low general range of costs, $20 to $75 an acre compared to up to $300 or more an acre for tile systems, usually appeals to farmers if they are convinced drainage is necessary and that surface drains will work.

How does a farmer make up his mind: (1) as to whether he should have better drainage, and (2) what kind of a surface drainage scheme he should use? A little guided exploration of these questions should help.

Detecting poor drainage is surely a first step. Signs that most operators recognize are large wet areas, marshy vegetation, discolored soil, delayed plant growth, prolonged mud following rain or thaw, or spots where the tractor always gets stuck. Not so easy to see are the shallow root systems that die of thirst when drouth comes, or the moisture-induced cold that deadens vitality of soil bacteria.

Usually more difficult is to tell precisely where the water is coming from, why it lingers, and how to get effectively rid of the excess. The particular kind of soil and subsoil on a farm has much to do with drainage. So has slope, length, and *area above* as well as *on* a problem field. And so, also, has the kind of vegetation on the watershed. Finally, amounts of drainage water that need to be removed in about a day's time have to be figured correctly. Help on these matters can, of course, be obtained from the soil conservation district, the extension service, or state college experiment station.

To save work and money, drainage specialists look first for a way to cut off water *before* it reaches and saturates a problem upland field. Interception and diversion channels are familiar eventual results of their inspection. These drain fields well, and they check erosion, too. Often, a single properly placed line will be enough. Soil conservation programs in the Northeast have installed over 5,000 miles of these drainage channels in the past 15 years. Farmers found out quickly that diversions helped them to work protected areas a month or more earlier in Spring. During the kind of wet years that previously ruined crops

Farmers have reported to USDA that they intend to raise 67 million turkeys in 1956, compared to 63 million in 1955.

completely, they produced good crops.

Diversions are usually placed on pronounced slopes, and long slopes may need several to trap all unneeded water. Spacings generally should not exceed 250 feet and may need to be closer where erosion is a real problem. Channels may often need to be cut deep—say 18 to 24 inches—to pick up shallow seepage in addition to surface waters. If shallower depths are desirable, tile can be used along with such channels. Diversion ditches may be several thousand feet long, but they should not be permitted to drain in one direction for more than 1,000 feet. Channel grades are adjusted to move water off fast enough to prevent oversoaking, yet not so fast that channels will be damaged by erosive water when running nearly full.

Interception ditches perform the same task as do the diversions but are placed at the base of hills or outer edges of a valley floor. They often drain stream bottomlands and depressions and, consequently, are dug as regular ditches rather than shallow channels on the slopes. Where water cannot be intercepted, farmers can work with specialists in developing relief-type drainage, the kind which causes water simply to move or to move more quickly from the land. So-called random channels are the simplest method of relieving wet spots in small, narrow, or stony fields limited to hay and pasture. The channels remove surface pondages by connecting them in series on the most favorable grade leading to an outlet.

Bedding is another kind of surface drainage that repays operators handsomely wherever there are areas of either level, heavy soils or shallow soils over rock and impervious subsoils. Many of these soils provided timothy hay for city horses 40 and more years ago. Beds in those days were established by plowing rectangular shaped lands from their edges toward the middle. Dead furrows between beds served as ditches to carry water to an outlet ditch or stream. Back furrows at bed centers served as crowns toward which successive plowings were built. Beds built by horse and plow were quite narrow and shallow; outlets were limited, and constant work was needed to keep them draining properly. Rising labor costs, reduced value of hay, and the disappearance of the horse plow all led to a gradual disuse of this

Total membership in farmer cooperatives has risen to 7.6 million, or about three out of every five farmers.

system and often to abandonment of land so drained.

But this basic drainage system of bedding has been redeveloped by today's conservation engineers to the point where it is well worth giving it another look—beds are often wider now — up to 100 feet—and they can be farmed easier. Crowns are graded to remove minor pockets and to provide satisfactory slope to the dead furrow; and use of surface smoothing equipment, such as dozers, graders, and land levelers, now adds to drainage efficiency. Altogether, the modern bedding system has better outlet construction and uniformly engineered grades that move surplus water steadily from the most remote bed to the point of disposal.

Here are some good rules of thumb that U. S. Soil Conservation Service specialists like to point out to farmers planning on surface drainage: (1) Look for a good, safe, and adequate outlet. (2) Obtain a plan to provide proper grade and capacity, to cut off upland water whenever possible, and to move water promptly to the outlet without ponding or too much soaking. In other words, demand a well-engineered job. (3) Get a system that fits the farming operation, the machinery, the enterprise. (4) Tie drainage into the entire conservation plan. In short, get better land use as well as water use out of the system. Have it check erosion, as well as provide drainage. (5) Be sure the investment offers reasonable returns. (6) Do not let initial cost figures put the plan to flight. (7) Plan on giving regular maintenance to the drainage system. Remove silt and debris promptly after heavy rains so that drains give continuous top performance.

Systematic Insecticide Controls Insects

Texas entomologists report that cotton grown from seed treated with a new systematic insecticide has been protected against thrips, aphids, spider mites and leaf miners for four to six weeks from date of planting. A systematic insecticide is one that can be taken up by plants and translocated to all its parts.

Advantages of the systematic insecticide are four to six weeks protection against certain insects, and elimination of the first two poison applications by spraying or dusting. Adverse weather conditions cannot destroy the effectiveness of the poison in the plants. Loss of time from transportation of seed, and three dollars per acre as compared to two dollars when dusting or spraying is employed, offer some disadvantage. *—Texas A. & M. College*

His Management Makes the Most of Every Acre

An outstanding example of good farm management on a 200 acre Northwest farm . . .

Condensed from Farm Management

W. B. Tucker and *E. R. Jackman*

THE STATE of Oregon grants no "Master Farmer" degree. If it did, there is one logical candidate, Otto Bohnert of Central Point, down near the California line.

Here's one example of why he holds that rank. In 1953 he was allotted one pound of the new and glamorous turf grass, Merion bluegrass. He paid $15 for it, a fancy price; 14 months later he sold $29,400 worth of seed grown from that single pound.

He did this by seeding half of the pound in flats such as nurserymen use, then painstakingly transplanted the young seedlings to a 10-acre field, one foot apart, in 40-inch rows. The following year, that field turned off 840 pounds of "foundation" seed to the acre and Bohnert sold it for $3.50 a pound.

Other farmers got small amounts of the precious "breeders seed" in 1953, but no one else thought of stretching it by hand planting. Bohnert's returns in 1955 were equally good on an increased acreage.

14 Crops — 200 Acres

What makes Bohnert more remarkable is that he carried on this kind of intensive production with 14 crops on a 200-acre farm. This breakdown of his 1955 acre-

Every man has two educations—that which is given to him and, the other, that which he gives himself . . . Indeed, all that is most worthy in a man he must work out and conquer for himself. It is that which constitutes our real and best nourishment.

Reprinted by permission from Farm Management, Union Stock Yards, Los Angeles, California

ages and yields tells the story:

Crop	Acres	Yield
Merion bluegrass	66.5	500 lbs.
Alfalfa hay	26	6 tons
Wheat	18	40 bu.
Strawberries (Northwest)	15	8 tons
Onions (Sweet Spanish-Danvers cross)	6	600 sacks (100 lbs.)
Alfalfa seed (Talent)	14	307 lbs.
Birdsfoot trefoil seed (Granger lotus)	7	200 lbs.
Sugar beet seed	10	4000 lbs.
Pennlawn fescue seed	3	new seeding
Polycross bentgrass seed	15	new planting
English walnuts	8	1100 lbs.
Peaches	5	new planting
Pear seedling rootstocks	1	3500 trees
Early potatoes (Kennebeck & Pontiac)	7	400 sacks

Notice the range of crops: six seed crops, hay, cereal grain, fruits and nuts, row crops and berries. And notice the yields: 400 sacks of potatoes, 4,000 pounds of sugar beet seed, 6 tons of hay.

What kind of a farm is this, and what kind of a farmer?

Not what you might think, on either point. Bohnert's land is low in available phosphate, low in potash, low in lime. Bohnert has no college education, didn't even go through high school. He started with little or nothing; to put himself throught the last of his school years he raised rhubarb.

Takes Chances

But he has these things: a feverish urge to do all things well; eyes that see; a mind that records; great mechanical ability, and a willingness to take a chance on anything new. The crop list illustrates the point: Polycross bent, so new it isn't yet on the market; Pennlawn fescue, only a handful on the market; Granger lotus, not on the market in quantity, and the high yielding hybrid onion, a recent development.

Otto has, for years, been at the top of his profession. He never hesitates to tell anyone about his farming methods and how he gets his high yields. He experiments endlessly, tries everything, and tells what he learns to anyone who asks for it. "Aren't you afraid others will adopt your methods and pull down prices in your market?" To this question, Bohnert replies, "By then I'll be growing something else."

There is a good story in every crop he grows. But just because it is so new, let's take the Polycross bent.

Smooth, velvety putting greens are the ambition and despair of the thousands of golfers who serve on greens committees from Maine to California. The bentgrasses used for putting greens are problem grasses; they will not

come true from seed. They are all cross-pollinized and hence are hybrids; this makes it hard to produce seed that will make good, uniform greens.

Dr. H. B. Musser at Penn State has worked for years trying to get a bent that wouldn't break up into all kinds of bents if grown from seed. Finally he took one of the leaves from the corn breeders' book. He developed three bents that would cross and that were so nearly of the same origin that the resulting seed grew into uniform plants. But this seed cannot be used for seed production, or the old buried traits show up again. So this bentgrass must be regrown in a series of three rows, a row devoted to each of the original plants.

Of course, this means the ambitious seed grower doesn't buy seed; he must buy plants in gallon cans, each one coming from a separate plant. This presented the kind of challenge that Bohnert enjoys, and he became one of the first to produce the new seed.

Starting with three one-gallon containers in March of 1955, Bohnert increased them in the greenhouse by stem and root division. Then he transplanted the plants by hand into a one-acre nursery plot in April and May. In June, after the strawberries were harvested and the 15-acre field plowed and prepared, he dug Polycross plants from the nursery, divided the clumps and transplanted them into the seed field, using a machine he developed for this purpose.

A similar technique, incidentally, was followed in increasing his acreage of Merion bluegrass. He used only half his one-pound supply for planting in flats; the other half-pound was seeded by conventional methods in a half-acre nursery. From this he's taken plants to expand the Merion acreage.

With all his ability and his imposing record, Bohnert is quiet and unassuming. At farm meetings he is eager to hear of new developments and asks keen questions but never gives an opinion unless he is asked. Even then he offers it with a hesitant air as though what he is saying isn't worth very much.

But people who know what he's done listen carefully to his advice.

The United States' per capita consumption of milk is lower than the amount used per person in several other countries. As a group, women are the lowest milk consumers. Older women use less milk than younger women, although their need for milk is just as great.

How You Can Use U.S.D.A. Estimates

Get on the list to receive U. S. Crop Estimates. They're free, but can be mighty valuable . . .

Condensed from The Kentucky Farmer

LARGE chunks of the budgets of big corporations each year are earmarked for salaries and expenses of statisticians and economists.

In business conference, their production goals and estimates receive the utmost attention and everything is built around them.

Farmers too have a large staff of statisticians and economists working for them. And, in the current cost-price squeeze in agricultural production, it behooves farmers to take every advantage of this information in planning production and marketing schedules.

These statisticians and economists, located in each of the 48 states, keep in constant touch with what farm production is under way. They report on prices, quantity and quality, as well as how crops and livestock actually are doing.

Farmers Are Reporters

They do this from information from thousands of farmers, dealers and others serving as "crop reporters."

After receiving this information from the "grass roots" they analyze it, and do a little field inspection on their own. Combining all of it, they arrive at production totals which they publish and which are available to anyone for the asking.

The statisticians gather information on everything from livestock to tung nuts and peppermint, depending on production in the individual states.

This information is studied by the economists in Washington who use it as the basis to report farmers' intentions with regard to future production along with the market and price outlook in what they call "situation reports."

From no other place can a farmer secure such valuable information. Reports have been amazingly accurate most of the time. Most agricultural colleges and experiment services use them as a basis for farm outlook reports and other economic studies.

Reprinted by permission from The Kentucky Farmer, Louisville, Kentucky

Although much of the information is published and broadcast, farmers need not rely on that source entirely but can get the information directly from the department simply by writing and requesting it.

In addition, each summer, weather forecasts and crop condition reports are issued weekly by the state statisticians' offices. Because of this, the statisticians usually are among the first to spot areas of trouble like droughts, floods, insect invasions and other farming hazards.

Services Not New

Despite the fact that so many farmers are not now taking advantage of this service, it is by no means a new one. The service was first established under President Abraham Lincoln in 1862.

A visitor to the U.S.D.A.'s office in Washington on the days when the figures on the nation's estimated production of wheat, corn, soybeans and a few other crops are released by the crop estimates board would think from the number of armed guards that Hydrogen bomb secrets or Fort Knox's gold were inside. Reporters swarm all over the place until the exact moment of release.

This dramatic little scene is repeated many times a year but it is done to prevent speculators from getting an unfair advantage.

Like giant corporations each individual farmer needs to know what his competitors are doing so that he can plan his operations accordingly. The U.S.D.A. serves this need of farmers and no farmer should be without it.

Consider the shrunken dollar, a fraction of what it was. It won't do the work it used to, but then, after all who does?

These estimates and outlook reports should be the basis of all farm planning and if you are not now getting them, simply write the statisticians in your state and ask to be put on their free crop estimates mailing list.

Some farmers like to serve as crop reporters, and are urged to do so to make the service even more accurate.

To receive the crop estimates report or to serve as a reporter, ask your County Agent for the address of your state office. Or, simply address your letter to: The State Director of Agriculture at your state capitol, and ask that your request be referred to the Federal Agricultural Statistician.

For the situation reports write the U.S.D.A. Office of Information, Washington 25, D. C.

Ray Baxter's Cattle Feeding Program

The record of a successful Nebraska cattle-feeder who operates on a large scale . . .

Condensed from Nebraska Farmer

Dick Coffey

THE telephone is a mighty handy instrument in Ray Baxter's cattle feeding operations, for most of his buying and selling are conducted over the wire.

One minute Ray might well be talking from his Hall County, Nebraska farm to Big Spring, Texas; the next to Billings, Montana. He has commission men located throughout the western and southern cow country.

But being a telephone "executive" is only part of his job. Come feeding time, callers will find Ray in the feed lots with his two sons and their three hired men. The Baxters feed between 1,500 and 2,000 head of cattle the year around, buying and selling every week. The cattle are in 10 different feed lots and are efficiently "dined" in three hours with the use of two power feed wagons.

Each yard which is equipped with feed bunks and lanes and gates leading to sorting alleys is fed individually and a feed sheet is kept on all 10 yards. The feed is weighed by an overhead scale in Baxter's 40,000 bushel elevator.

Feeding Program

Ray aims to buy heifers weighing from 600 to 650 pounds, and steers from 700 to 900 pounds. He starts his new cattle on about 10 pounds of silage, four pounds of alfalfa pellets and one pound of supplement. He feeds steers about five pounds of corn, and heifers, three pounds of corn. The shelled corn is ground with a steel cut roller mill. He keeps crowding more corn to the cattle. When they are on full feed which takes between two and three weeks, depending upon the cattle, the average steer eats between 20 and 22 pounds of corn; the average heifer, between 18 and 20 pounds of corn.

Ray adds more ground alfalfa when they are on full feed, decreases the alfalfa pellets two pounds per day and decreases silage. After the cattle have been on full feed for 60 days, he eliminates silage entirely.

Baxter feeds stilbestrol and be-

Reprinted by permission from Nebraska Farmer, Lincoln, Nebraska

lieves that it is the only thing that has helped save the cattle feeder this year. He uses 10 milligrams per pound in his supplement so the cattle will get the maximum amount. The results have been very favorable. He has been getting additional gains of one-quarter to one-half pounds per days, resulting in a cut of from $1 to $2 per hundred in feed costs. Soybean, linseed and cotton seed are also in the supplement.

Texas rancher, Bascom Munson, caught 132 buzzards in a demonstration trap at one time. Texas buzzards polute drinking water and grass, peck the eyes of baby calves sometimes killing and eating them and may even attack a weak mother cow.

During the summer, Ray feeds about 500 head of cattle on pasture—brome, alfalfa and native grasses. At the same time, the herd is on full feed of grain with less hay, and no alfalfa pellets. Otherwise, they are on the same ration as feed-lot cattle when on full feed.

Marketing Time

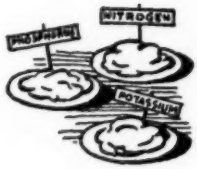
He figures his average feeding period at 120 to 150 days, selling his heifers at 900 to 1,000 pounds, and his steers at 1,100 to 1,200 pounds. Ray weighs all cattle that come in and go out, and keeps scale tickets on all cattle as well as grain bought. These serve mainly as records for protection and accuracy. His feed yards are equipped with a 100,000-pound scale with a 45-foot platform.

The Baxters have three grain and hay trucks with hydraulic dumps and one large 39-foot semi-truck to haul cattle. They haul most of their cattle themselves, and market in Omaha, Kansas City and St. Joseph.

Besides their cattle feeding operations, they raise 150 acres of alfalfa and 100 acres of irrigated corn. They have 150 acres of pasture. Although last year's alfalfa crop was poor due to drouth conditions, the corn made 70 bushels per acre as a result of Ray's ditch irrigation system. The water is supplied by two wells. The corn was fertilized with 100 pounds of starter fertilizer (10-36-0) when it was planted. And just before Ray began irrigating, he applied 32% nitrogen at 150 pounds per acre. He also runs cattle in the corn fields during the winter.

Ad in a midwestern newspaper: "Four-Poster Bed, 101 years old with springs. Perfect for antique lover."

Behind That "New Look" In Fertilizers



Many changes have occurred in fertilizers and their application. Many more are coming . . .

Condensed from New Jersey Farm and Garden

George H. Serviss

THINGS are happening in the field of fertilizers. This includes usage, nature of fertilizers themselves, merchandising, and handling from plant to farm. Any prediction as to how far some of these trends will go is at best a guess. Let's take a look at some of the things that are taking place:

Granular Complete

This is the most rapidly moving change in the industry. Farmers have used granular or pelleted materials for years, but only recently has there been much activity in the mixed goods industry. With granulation will go an increase in concentration.

In granulation the conventional conditioning agent, which contains little if any plant food, is not wanted. Neither is filler, whether sand or limestone. Leaving out conditioners and fillers thus automatically steps up concentration and results in some material cost savings that offset part of the extra manufacturing cost. Somewhat higher ammoniation rates are used. This results in further savings and is also desirable in obtaining good granulation.

Granular high analysis fertilizers are being produced by several manufacturers. Agronomically, the granulars are fully as effective as powdered fertilizers. On soils having a high fixing capacity for phosphorus we believe they are somewhat superior. That's because phosphorus fixation is slowed down by having it in a granule; thus high availability is retained longer.

In considering how high to go in concentration of a given ratio of granular materials, ease of manufacturing must be considered as well as material costs.

Reprinted by permission from New Jersey Farm and Garden, Sea Isle City, New Jersey

With conventional materials the 10-10-10 could become a 12-12-12. One method involving the use of nitric acid results in a 14-14-14. A logical step-up for an 8-16-8 is 10-20-10.

A 10-10-10 granular can be made with all the phosphoric acid coming from ordinary superphosphate, whereas with powdered 10-10-10, considerable triple superphosphate is necessary. New materials and new processes could change the picture.

Liquid Nitrogen

There are many types now on the market and perhaps more to come. We include anhydrous ammonia in this classification since it is a liquid when kept under pressure. Since solid nitrogen materials with few exceptions are made from liquids, we expect to see liquid nitrogen remain cheaper than solids, hence used increasingly more.

I do not expect liquids to run solids out of the picture since there are many places where solids fit. The farmer now has and will continue to have a wide choice of nitrogen materials.

One of the interesting things in the development of anhydrous ammonia for agricultural use has been the bypassing of the conventional fertilizer industry. Whether this will continue or swing back we are not sure, but taking the country as a whole, we expect to see a partial swing back.

Few mixed fertilizer manufacturers or distributors were interested in the distribution of anhydrous ammonia or nitrogen solution at the start. For one reason or another oil companies, gas companies, and numerous feed dealers took on one or both. Now many of these are expanding by going into complete fertilizers and many old-time companies are becoming interested in anhydrous ammonia or solutions.

Liquid Complete

This is the newest wrinkle in the field of fertilizer manufacture and about the most difficult to figure for the future. I believe liquid complete ratios are here to stay, but will take a long time to make an appreciable dent in the use of fertilizers. The greatest growth has been in California where they are a "natural" because of the ease of applying them in irrigation water.

The only material needed for the manufacture of liquid complete fertilizer that is not used in dry is liquid phosphoric acid. Phosphorus in this form costs substantially more than in superphosphate. There is little reason to believe that liquid has any agronomic advantage over dry.

The answer to the future use of liquid appears to rest with the farmer. He may prefer to pump

fertilizer rather than handle bags. One drawback is the limit on concentration because of the plant foods turning into crystals at temperatures below 65 degrees.

It is entirely possible that some technological development may come along that will make possible some increased concentration in liquid complete fertilizers and thus decrease the "salting out" problem. But it is doubtful if concentrations can ever go as high as dry materials.

Bulk Fertilizer

It costs money to put fertilizer in bags. In paper the cost is in the vicinity of $3. Few farmers have any use for these paper bags after they are emptied. This represents a substantial saving if the farmer has the equipment to handle bulk fertilizer. Farmers may also buy fertilizer spread for about the same cost as delivered in bags. In certain areas this has grown to represent a substantial part of the tonnage.

Because of the nature of the fertilizer business—the big spring peak and the slack for most months of the year—there is a limit as to how far this can go. It is doubtful if industry can afford to own enough spreading trucks to care for the peak demand and have them sit idle for most of the year.

Direct to Farm

A large part of the fertilizer used today moves from the point of manufacture direct to the farm. This by-passes local retail facilities to a greater or less extent. In many instances there is a complete by-pass.

Where fertilizer is bulk spread by trucks, the supplier delivers and spreads it. Many farmers, though, are now hauling their own bulk for use in their own spreading equipment.

The farmer getting a truck load of a given quantity automatically becomes a dealer. If this continues, nearly all farmers will become dealers and then some new name for dealer will be found and the cycle will start over again. In my opinion, the local dealer serves a useful function. If he should be eliminated, the manufacturer will have to put more salesmen on the road and the result cost-wise will be about the same.

Soil Testing

Within the next few years soil testing appears certain to have a terrific impact on fertilizer usage and practices. Few farmers will use fertilizer without a complete soil test. Some of the more popular present day analyses, such as 4-12-4 and 4-12-8, are likely to go by the boards. Some new ones will appear.

The fertilizer use season in the North is short. This means a tremendous investment for storage

and adds to the cost of fertilizer. If agronomists can find ways for the farmer to profitably use fertilizer on a more even basis throughout the year, it will help to keep costs down. At present, grassland fertilization offers most promise of benefit to all.

The common belief that timber should be cut when the sap is down is not supported by fact. There is practically no difference in moisture content of green wood in winter and summer.

Off-Season Use

There is already substantial off-season storage of powdered fertilizers on Northeastern farms. Little trouble occurs if they are well cured and properly formulated. There is always the possibility of finding better conditioning additives. Granular fertilizers are a natural for off-season farm storage.

High nitrogen grades such as 10-10-10 will be about $1 a ton cheaper in 1956 than 1955. The difference will be much less on lower analysis grades. Some variation always occurs from place to place due to costs of materials delivered.

Whatever the future may hold for the fertilizer industry, you can be sure only of one thing: it will be as different 10 years hence as day from night.

Cattle Numbers Continued Up In 1955

Cattle numbers crept up 1 per cent during the past year. The increase, though small, came as a surprise, since farm statisticians believed the large slaughter in 1955 had checked the climb in numbers that began back in 1950. With cattle numbers at another new high, we can expect beef production in 1956 to equal or exceed the record output of 1955.

Cattle numbers in the United States tend to run in waves or cycles. Farmers build up their herds for 5 to 10 years and then sell off. Beef production is low during the build-up years; then it increases sharply when farmers increase their sales of cattle.

The present build-up of cattle numbers began in 1949. At the beginning of that year, farmers and ranchers had only 76,830,000 cattle and calves. During the seven years since then, farmers have increased their herds by 21 million head, or 27 per cent.

—Farmer's Outlook Letter

French Alfalfas Look Good

Newly introduced varieties, now under test, have made a good showing . . .

Condensed from
New Jersey Agriculture

H. Russell Stanton, Agricultural Extension Service

TWO newcomer alfalfas from France named DuPuits and Socheville may some day join with Yankee partners to put extra money into the pockets of American farmers.

DuPuits and Socheville made yields that surprised farm crop researchers in alfalfa trials last summer. They were in a class with Atlantic, the Jersey-bred variety, and Vernal, a Wisconsin research product.

The imports had a slight edge on the widely-planted American varieties, but hardly enough to make any real difference. DuPuits yielded 4.56 tons to the acre, while Socheville, 4.29 tons. Atlantic and Vernal were equal in their yield, each producing 4.39 tons.

Differences among the four varieties were not nearly as significant as the considerably better performance of each of them in comparison with older varieties. For example, farmers for years planted a variety named Grimm, which had an average yield record in last summers' trials of 3.77 tons. Atlantic, of course, has just about put Grimm out of the picture because of its ability as a far superior producer.

As tests go on, DuPuits and Socheville may prove to have other worthwhile characteristics besides yielding ability. On the other hand, they may not be able to thrive in the country's extremes of climate. Only time will tell, and so researchers are prepared to go ahead with tests of persistence over a period of several years.

When the final results are in, they will know if DuPuits and Socheville can make the first team.

The summary of the tests came in a recent report of two Rutgers farm crop scientists, Dr. Warren R. Battle, research specialist, and William Jurgelsky, Jr., research fellow. Their figures were based on tests made on plots at New

Reprinted from New Jersey Agriculture, Rutgers, New Jersey

Brunswick, Califon, and Harrisonville.

Some varieties performed better in one location than another, but drawing data together for Central, North and South Jersey provides a picture of performance for the state as a whole.

These alfalfa variety tests spotlight the cooperative nature of scientific research, among both nations and states. The New Jersey trials are part of a national alfalfa improvement plan. Crops scientists in seven other eastern states are studying the same varieties, and their reports will be analyzed and combined as part of the general plan to discover outstanding varieties especially adapted to the humid East.

Methods of seeding, harvesting, and other details were standardized for greater accuracy, so that figures can be brought together in an annual report of the Uniform Alfalfa Nurseries.

CLEAN WHEAT RULES TO GET TOUGHER

The Food and Drug Admin. will tighten sanitary requirements on wheat beginning next July, according to entomologist T. R. Robb.

Cars of wheat, under the stiffer rules, will be condemned if they test: (1) one or more rodent pellets per pint of wheat (liquid measure), or (2) 1 per cent or more of insect-damaged kernels. The new rules go into effect July 1, 1956, the beginning of the crop year.

Sanitary rules used since last January condemned wheat if it contained 2 or more rodent pellets per pint or 2 per cent or more insect-damaged kernels. In spot-checking 3754 cars of wheat between January and July 31, 1955, inspectors found 29 over the limits on rodent filth and three with 2 per cent or more insect-damaged kernels.

The tightening of rules came from examination of this year's program. George P. Larrick, Food and Drug Commissioner, said the program so far has improved "handling and storage of wheat to prevent contamination."

"However, experience acquired during the past six months," he said, "shows that the levels of judgment should be tightened if the program is to continue to be effective in promoting increased cleanliness in the Nation's food supply."

Larrick warned that the new rules do not apply to (1) deliberate mixing of filthy wheat with clean grain in an attempt to dilute contamination or (2) to wheat contaminated as a result of continued insanitary storage conditions. Such practices are automatic violations. *University of Wyoming*

Alfalfa Weevil Invades the North East

The dread alfalfa weevil has spread from the West Coast, but may be held in check if proper measures are taken . . .

Condensed from American Agriculturist

George Gyrisco

THE alfalfa weevil first appeared near Salt Lake, Utah, in 1904 and spread rapidly to Arizona, California, Colorado, Idaho, Montana, Nebraska, Dakota, and Wyoming.

Eastern growers felt secure, believing the insect to be a pest of the arid West. However, in 1952, the weevil suddenly appeared near Belaire, Maryland, and scouting showed it to be present in Delaware, Virginia, Pennsylvania and New Jersey as well. By 1953, the insect had become widespread at an alarming rate in those states and was beginning to cause serious injury to alfalfa. The insect is now known to be present in Maryland, Virginia, New Jersey, Delaware, Pennsylvania, North Carolina and New York. This year in certain parts of Delaware, Virginia and Maryland, no alfalfa could be grown unless preventive measures were taken to control the insects.

Nature of the Injury

Both the adults and larvae feed on the top leaves, buds, and young shoots. The leaves are skeletonized and severely damaged. The injured leaves dry up, leaving only the larger stalks, and giving the field a greyish white cast much like that caused by a severe frost in early fall. Young shoots on the second crop are often completely destroyed. Injury may be so moderate that there is only a slight loss in yield and feeding value, but on the other hand, it may be so great that little to no hay can be harvested.

The weevils have been recorded feeding on alfalfa, vetch, alsike clover, birdsfoot trefoil, red clover, crimson clover, white clover, yellow and white sweet clover, cabbage, potato, and raspberry. Although the insect will feed on a rather wide range of host plants, alfalfa seems to be the

Reprinted by permission from American Agriculturist, Ithaca, New York

only one that is severely destroyed.

Life History

The weevil overwinters in the adult stage, but under eastern conditions may pass the winter in the larval or even the egg stage. In early spring the weevil comes out of hibernation and, after a period of feeding on the new alfalfa growth, begins to lay eggs. The yellow eggs are laid inside of old stubble and growing stems in small clusters of 3 to 30 or more. In a week or two the eggs hatch into tiny yellow larvae with shining black heads. These larvae begin feeding on the tender buds and upper leaves of the plants. The larvae continues to feed, and molts 3 times before it is mature in about 4 weeks. When it is full-grown the larvae is nearly a half inch long. It has a black head and a green body with a wide stripe and two fine white stripes down the middle of its back. The fully grown larva spins a loose brownish white cocoon usually on the plant, though in the west it spins its cocoon on the ground. Within the cocoon, it pupates, or passes through an inactive resting stage, before it emerges as an adult.

The adult is a robust, brown snout beetle about ¼ inch long with a dark brown stripe extending along its head, thorax, and back. At first the weevils are rather tan in color, but later change to dark brown or nearly black.

In the West there is only one generation a year but here in the East there is believed to be a partial second or even a third generation a year.

Control of Weevil

In the West, the alfalfa weevil has been held in check to some extent by a small black wasp which lays its eggs in the larvae of the weevil. Under ideal conditions, these wasps can kill up to 90 per cent of the larvae of the alfalfa weevil. These parasites have been released in the East by the United States Department of Agriculture, but so far only a few parasitized weevil larvae have been recovered. Also, a fungous disease of the weevils has given some control in the East but only on a very limited scale.

If alfalfa is to be grown in areas of serious infestations, applications of insecticides will have to be used to protect the growing crop. Early tests by the USDA and some states indicate that western control measures are not applicable in the East. However, one or more applications of endrin or heptachlor, applied early or up until the crop is nearly half grown, have given good crop protection. The same applications will also control spittlebugs present at that time.

What Is Good Hay?

Even the experts tend to overrate poor hay and underrate good hay . . .

Condensed from Michigan Farmer

Carl Orr, Michigan State University

CAN YOU tell good hay from poor hay? That's not as silly a question as it sounds—it sometimes stumps the experts when the only clue is how the hay looks after harvest.

You're liable to make a bad guess when you just rely on how green the hay is. Alfalfa that's cut in the early bloom stage and rain damaged, for instance, usually is better than green hay that was harvested in full bloom without rain damage — even if it's from the same field.

And you might think old bossy is off her rocker when she passes up the green stuff for the brown, weathered hay. But she's sometimes a better judge of quality and feeding value than her owner.

A group of 14 Michigan State University staff members found out how deceiving hay can be when they judged some samples recently. And they knew the harvest date and the amount of rain that hit the samples. They placed the medium quality hay okay but most of them overrated the poor hay and underrated the top quality forage.

Bossy Can't Read

Their judgments were pitted against a chemical analysis in the laboratory, probably the best way to tell what the quality hay is. This scientific method isn't always right either. Some forages that are judged excellent quality in the lab are shunned by bossy or she won't produce milk like she should if she has to eat the stuff. That was shown in feeding trials at the experiment station.

Of course there are ways a farmer can be something of an expert in judging how much value there is in different forage crops. But he needs to know these facts:

The kinds of forages in the stand, the date of harvest and

Reprinted by permission from Michigan Farmer, Detroit, Michigan

the harvesting and storage methods used.

If a farmer wants to improve the quality of his forage it may be important to change the kinds and proportion of legumes and grasses in the stand.

A stand high in alfalfa usually makes better quality forage than one high in grasses. Grasses like brome, timothy—and quackgrass—usually mature quicker than legumes. And they're woody and low in protein early in the growing season.

In fact, a ton of alfalfa hay harvested at the same date as a ton of bromegrass has almost twice as much digestible protein.

Other things, of course, are important, too. A study of 172 dairy farms in south central Michigan showed that 20 farmers who had the best alfalfa-brome stands used a lot more fertilizer both at seeding time and as a top dressing. Farmers with the poor stands used substantial amounts of fertilizer, however.

And a higher percentage of the farmers with good stands were testing their soil for lime and were supplying lime oftener. Many farmers with the poorest stands pastured their alfalfa-brome fields in September. That, of course, didn't let the roots build up a reserve of food for winter. So the stand suffered.

Alfalfa-brome stands that were 4 or more years old, were generally low in legumes and rated medium or poor quality.

Date of Harvest Important

In the study, date of harvest showed up as mighty important in quality. Forages cut early—by June 20th—in south central Michigan are usually high in protein regardless of whether they consist largely of grasses or legumes. They often test better than 20 per cent crude protein. It's hard on alfalfa-brome to cut it earlier than June 20th.

But the range in the crude protein content of excellent stands of alfalfa-brome ranged from a high of 22 per cent when harvested in early June to 13 or 14 per cent in mid-July.

One of the biggest bugaboos in getting good quality hay in Michigan is rain. You can expect only a couple of days in a row with no rain in the last 2 weeks of June. So the operations have to be quickies when you consider that 15 to 20 hours of sunshine are needed to field-cure hay for loading or baling. That's where a field crusher comes in handy . . . it'll reduce the needed sunshine to 8 or 10 hours.

That, of course, points up the advantage of silage. A U.S. Department of Agriculture 5-year study showed that field cured hay had to lay as long as 109 hours after mowing when it was rained on. And when the grass

silage method was used the interval between cutting and storage was as low as 8 hours.

Almost one-half of the protein was lost during harvest and in storage when rain damaged the field-cured hay. The losses were reduced to less than 25 per cent when the hay was dried in the barn, and to 18 per cent when the alfalfa was harvested as grass silage or dehydrated hay.

Research showed that the cost of feed to produce 100 pounds of milk can be cut by as much as 25 per cent on the average dairy farm by improving the quality of the forage, then feeding more forage and less grain and supplement.

So, from these studies it looks as though a farmer who wants to improve his forage could do best by:

1. Using a pasture mixture high in alfalfa.
2. Plowing under alfalfa after 3 years.
3. Harvesting hay a little earlier, when there's a sprinkling of bloom.
4. Aiming for high yields of hay and pasture by making sure the land gets enough lime and fertilizer.
5. Avoiding late harvest of alfalfa unless the field is to be plowed under the next year.

Tenants Hit By Farm Price Drop

Many farm tenants have been hard hit by the drop in farm prices. This is true especially of those former tenants who have started farming for themselves in recent years since farm costs have reached such high levels.

Some landowners who paid high prices for land and assumed heavy mortgages also have been badly hurt by the lower prices for farm products.

The situation is similar to that of the early '30s, but there are differences. While the net farm income for the United States has dropped about three billion dollars in the past three years—to less than 11 billion dollars in 1955—conditions in the '30s were much worse. Some of us have forgotten that total annual net farm income from 1930 to 1934 averaged less than 4 billion dollars.

The present situation is, however, serious for many farmers who are not well enough established to stand a poor year and who have heavy obligations to meet. —*University of Illinois*

Grass and Legume Seedlings Can Be Saved

Grasslands affect the income and profits on nearly four-fifths of the nation's farms, yet with no other crop is seeding failure so common . . .

Condensed from Plant Food Review

David F. Beard, Agricultural Administrator,
Field Crops Research Branch USDA

THIS year American farmers will spend, as usual, over $200,000,000 for legume and grass seeds to establish hay and pasture crops. This is twice the annual expenditure for fertilizers applied directly to these crops. Though some of the fertilizer applied to other crops in the rotation obviously is intended for the "second table" at which the grasses and legumes feed, this disparity between seed planted and nutrients applied can be costly to grassland farmers from the day they seed their grasses and legumes.

With no other crop is seeding failure accepted with so much complacency, and with such disastrous results from the standpoint of an efficient livestock and soil-conserving agriculture. Yet, grasslands affect the income and profit on nearly 4/5 of the Nation's 5,382,000 farms.

With no other major crop is the method of seeding as varied, frequently as primitive, or generally as undependable.

This situation is not too surprising when one considers that until very recently grasslands have been relegated to the "second table" in most respects. Statistical reports on sources of farm income frequently are misinterpreted or misapplied in a way that creates the impression that such products as wheat, cotton, soybeans, corn, hogs, cattle, milk, poultry and eggs are the principal sources of agricultural wealth. However, about 2/3 the farm value of animal products, on the average, is the dollar value of the feed consumed, over 50 per cent of which is hay and pasture.

With public appreciation of the real basis of agricultural wealth so far out of focus, our major feed resources—hay and

Reprinted by permission from the Plant Food Review

pasture—which also happen to be our best soil- and water-conserving and soil-building crops, have suffered from a sustained inadequacy of research attention, including research on establishment methods.

Even so, evidence is available with a dozen or so of the 125 to 150 major grasses and legumes to indicate that, with adequate research, establishment costs can be reduced for most grasses and legumes. Annual saving in the seed bill of at least $50,000,000 is possible, together with a further contribution through larger and earlier initial returns from grassland crops that defies calculation. In rotation with other crops, regular turning under of thrifty sods, as opposed to the less frequent turning of run down meadows and pastures, is another substantial, though intangible, benefit resulting from seeding methods that assure establishment of grass-legume seedings.

Some of the more important causes of establishment failure, along with a few corrective measures that have proved to be helpful, are:

1. Lack of moisture for germination, seedling development or both.

2. Competition of companion crop or other established vegetation.

3. Improper depth of planting—too deep or lack of coverage.

4. Lack of plant nutrients.

5. Soil acidity or excess salt concentration.

6. Improper seed bed preparation—specifically lack of firmness.

7. Poor quality seed.

8. Weed competition.

9. Formation of soil crusts after planting.

10. Winter killing.

11. Seedling diseases.

12. Insects.

13. Use of unadapted species, strains or varieties.

14. Improper date of seeding.

15. Mismanagement of seedling stands.

16. Damage from herbicides.

Some of these factors may be interrelated. For example, effects of planting too deep and soil crusting are so closely associated under some conditions that the major cause of difficulty cannot be identified. Similarly, date of seeding may influence the degree of winter killing so directly that either or both could be blamed for establishment failure.

Basically, most grass and legume seeds are more difficult to plant properly than other major farm crops because of the small size of the seed. This characteristic not only increases the problem of accurate metering and uniform flow from the seeder, but it also magnifies the impor-

tance of a fixed range in depth of coverage. For example, under normal conditions varying the depth of planting corn between 1½ and 2½ inches has little effect on stands or yield. With the small seeded grasses and legumes a ½ inch departure from the optimum depth of planting usually is disastrous.

Lack of Moisture

Lack of moisture for germination, and early development after germination, frequently can be avoided by preparing well in advance of seeding a finely granulated seed bed that is firm below the level the seed is to be planted and that provides good contact with the unworked soil beneath. Mulches are of value in maintaining a moist condition near the soil surface where most kinds of grass and legume seed must be planted. As little as one ton of straw to the acre can mean the difference between success and failure! As irrigation becomes increasingly available, it probably offers as much promise as any other practice in assuring the establishment of grass-legume plantings. This is particularly true in those areas where seedings are made at a time when the soil is warm, frequently dry, and emergence is delayed until it is too late for ample plant growth before winter.

Competition by Companion Crops

Competition by companion crops is a frequent cause of establishment failures in those areas of the country where legume-grass seedings are made in small grain. Improved grain varieties that do not tend to lodge so readily help the situation but do not always correct it. Lighter rates of seeding the companion grain crop, early grazing, clipping or using the crop for hay or silage reduces the competition it gives the new seeding. Drilling additional high phosphate fertilizer near the legume and grass seed when they are planted helps the new seeding compete for essential plant nutrients.

Seedings made in corn are hazardous at best, but chances for success are increased significantly by spacing the corn rows 60 inches or more apart and by completing the seeding while the corn is less than 24 to 30 inches tall. Striking differences in success have been observed between species and varieties seeded in corn, so considerably more experimentation is necessary in all parts of the Cornbelt to determine not only the best species but the best varieties and practices for seeding in corn. As new grass and legume varieties are developed, better ones for summer seeding in corn may be found.

Depth of Planting

Depth of planting needs far more attention than it receives

from the average planter. Most legume and grass plantings should not be more than ¾ inch deep, and ¼ to ½ inch usually is better. Under dry conditions, where there is little danger of soil crusting, and with some species, greater depths are satisfactory and sometimes necessary. To safely permit deeper planting, larger seed size and greater seedling vigor are objectives of several legume and grass breeding programs. Nordan crested wheatgrass is an example of a variety developed specifically to permit deeper planting. It has produced seed giving 80 per cent emergence when planted 3 inches deep, compared with standard crested wheatgrass which gave only 40 per cent. Such developments as this one will go a long way toward removing some of the hazard of legume-grass establishment inherent in small seed size.

Lack of Plant Nutrients

Lack of plant nutrients near the seed during germination and early growth probably leads to as many unsatisfactory stands and total failures as any other single cause in the cool humid part of the country. Enough fertilizer, especially phosphate, placed near the seed, hastens early growth and enables the plants to compete with weeds or a companion crop for plant nutrients, water, light and space.

With soil of low fertility, only 250 pounds per acre of a high phosphate c o m p l e t e fertilizer placed in a band one inch below the seed have given better stands and higher yields of forage the first cutting than 750 pounds per acre broadcast. In addition, the weed content of the forage was only one-fourth as much, indicating that weed competition was less damaging with fertilizer placed near the seeded grasses and legumes than with broadcast placement.

In the same experiment at Beltsville, Md., 5 of the 15 combinations tried were total failures, with weeds making up 40 per cent to 70 per cent of the first harvest and weed-free forage yields averaging only 410 pounds to the acre. With all of these methods the fertilizer or seed, or both, was broadcast. The six methods involving closer placement of seed and fertilizer gave first harvest yields averaging 2210 pounds of weed-free forage to the acre with a weed content ranging from a trace to 22 per cent.

This work, sustained in principle by previous and concurrent work at several State experiment stations, supports at least three significant conclusions:

1. Available plant nutrients in ample quantities increase the chance of establishing legume-grass seedings throughout the humid area.

2. Placement of applied nutri-

ents, especially phosphorus, in relation to the seed is frequently more important than the quantity applied in assuring establishment (within reasonable limits).

3. Fertilizer placement near the seed hastens early growth of the legumes and grasses, helps overcome weed competition and frequently increases the yield of the first harvested crop, whether for hay or pasture.

Soil Acidity or Excess Salt

Soil acidity, usually because it is associated with a lack of nutrient calcium, magnesium, or both, influences the successful establishment and growth of legumes relatively more than grasses. Moreover, legumes vary in their need for or response to lime. Though easily corrected, soil acidity is too often neglected and leads to legume seeding failures.

Excess salt is the problem peculiar to the arid-irrigated region that soil acidity is to the humid—but less easily corrected. Here the best, and frequently only, solution is to grow grasses and legumes that tolerate a high concentration of salt and to employ establishment techniques that reduce the salt hazard during establishment, such as planting on sloping beds. Where a choice is offered, the use of the least salty irrigation water has proved helpful in establishment and early growth of alfalfa, which later tolerates more salt.

Poor Quality Seed

Poor quality seed is not the hazard it was 20 years ago in obtaining good hay and pasture stands. However, it is still a contributing cause of failure. Satisfactory germination alone does not assure strong emergence when seed is planted in the soil. As seed ages it loses vigor—some kinds more rapidly than others. Time as well as vigor of germination may be affected. Storage under humid conditions hastens deterioration. With a need for all the punch that can be put behind small seeded legumes and grasses, plump, fresh seed should be used whenever possible to contribute to fast, successful establishment.

Weed Competition

Weed competition sometimes ruins new seedings that otherwise would develop into good stands. Now selective weed control chemicals offer some hope in bringing this problem under control. Timely seeding on a well-prepared firm seed bed, when there is enough moisture to insure quick emergence favors crop establishment in spite of weed competition.

Band seeding, which places a band of fertilizer directly below the seed, has proved to be very effective in promoting rapid growth of the grass-legume seed-

lings without stimulating weed growth to the extent that it is stimulated when fertilizer is broadcast.

Soil Crusting

Soil crusts are most troublesome on soils low in organic matter and high in clay or silt content when new plantings are subjected to hard rains before they emerge. The deeper the seed is planted and the looser the seed bed, the greater the damage from crusting. Where moisture for germination and establishment are not apt to become limiting, very shallow planting satisfactorily eliminates the crust hazard. Drilling, as opposed to broadcast seeding, provides for mutual assistance among the seedlings in breaking any crust that forms. Surface mulches offer some protection against crusting by (1) reducing the breakdown of the surface soil structure by beating rains, (2) reducing soil movement from washing and, (3) retaining a moist, soft surface condition through which emerging seedlings may penetrate with less difficulty.

Winter Killing

Winter killing, caused by heaving or freezing of young seedlings before they are established is best avoided by eliminating the causes leading to the trouble. Late planting, or late emergence due to adverse growing conditions are sometimes unavoidable but every reasonable step should be taken to avoid them. Practices already mentioned that insure rapid, early growth and the establishment of large plants before winter should never be slighted when winter killing is a threat. The top dressing of new seedings with manure or any other suitable mulching material also protects them from winter injury.

Seedling Diseases

Seedling diseases that are occasionally quite damaging can sometimes be controlled by appropriate seed treatment. Trials have been conducted under field conditions in many parts of the country to determine the value of this practice. Evidence to date supports neither general recommendation nor condemnation of the practice. Local results should be used to determine its value.

Insects

Insects that devour vegetation seldom pass up lush, new growth of recently planted grass and legumes. Grasshoppers are an example. Leafhoppers can be very destructive to new seedings when the pests are abundant in the area and migrate from adjoining hay fields that are harvested before new seedings are well established. Sweetclover weevil has been very destructive to new sweetclover planting in recent years. Whatever the pest, suitable protection at the appropriate time should be used to reduce or eliminate the

hazard. If resistant grasses or legumes can be substituted for susceptible ones with equal satisfaction, the problem can be "escaped" if not solved.

Unadapted Varieties

Unadapted species or varieties may not always increase difficulty in establishment, though yield and longevity of the crops may be affected. In fact, non-hardy alfalfa varieties with good seedling vigor frequently have been established more readily than adapted ones in Northern States. Nevertheless, adapted varieties should be used. Establishment failures caused primarily by the use of unadapted seed do occur and can be corrected only by using seed of adapted species or varieties.

The average ragweed plant has a water requirement three times that of corn. One plant of common mustard requires twice as much nitrogen, twice as much phosphorous, four times as much potash, and four times as much water as a well-developed oat plant.

Date of Seeding

Date of seeding may influence success of establishment for several reasons. Spring seedings must be made as early as soil and weather conditions permit to (1) assure moisture for germination and establishment ahead of hot, dry weather, (2) reduce the effect of competition from grain companion crops, or (3) to provide enough growth for safe overwintering.

Early seedings frequently can be made successfully by broadcasting seed on the surface and depending upon natural coverage by frost action or settling of honeycombed soil. Although drilling is generally superior to broadcasting on the same date, early broadcasting may be superior to delayed drilling made necessary by unfavorable soil or weather conditions.

With summer or fall seedings the problem usually is to have a firm, clean seed bed or sufficient soil moisture to assure quick emergence and sustained growth until freezing weather. Under some conditions, fall or winter seedings in dry soil are necessary to assure timely emergence in the spring when soil moisture and temperature are favorable for growth.

Mismanagement

Mismanagement of seedling stands can lead to total establishment failure, spotting and thinning of stands, winter killing and weakened plants that give lower yields. Also, it can reduce the quality of harvested forage. The combine harvester brought with it problems not previously encountered in the management of

new seedlings made in small grain that was harvested with the binder. Uneven straw distribution or heavy straw growth redistributed by the combine on new legume seedings has proved detrimental. Under such conditions, removal of the straw, the use of a chopper on the combine or other practices that distribute the straw evenly and place it promptly into contact with the soil are highly desirable.

Overgrazing of new seedings causes damage and frequently occurs when forage shortages result from drouth or other emergencies, or poor planning. Destructive diseases, as well as smothering, are sometimes associated with such mismanagement practices as leaving straw or heavy growth on legumes throughout the fall and winter. Under some situations early grazing tears from the soil young plants whose roots are not yet anchored firmly in the soil. On the contrary, well managed grazing legume stands can be beneficial by firming loose soil, by removing diseased top growth. stubble or other residue, and by removing competing growth.

Herbicide Damage

Damage from 2, 4-D type herbicides is a recent addition to the long list of factors contributing to legume establishment failures. The use of 2, 4-D to control weeds in small grain has in the past damaged many legume seedings in spite of warnings against such use. As a result, there now is a tendency to disrupt crop rotations by not seeding legumes in small grains when the use of 2, 4-D is anticipated. This disruption of good crop rotations probably is more serious than the 2, 4-D damage that might occur, although the ill effects may be less evident immediately than later.

Rate of seeding has not been included because insufficient seed in itself is seldom a cause of establishment failure. Furthermore, excess seed is seldom detrimental, albeit wasteful. If seed of low germination and vigor is used without adjusting the rate, lack of viable seed may cause failure. Nor can it be denied that normally excessive rates have been helpful in overcoming such hazards as soil crusts and weed competition.

Nevertheless, most seeding rates are excessive and wasteful. Satisfactory establishment of grasses and legumes have been obtained when good methods were used with from one-half to one-fourth the usual seeding rates. Like many homeowners who buy $10 worth of seed and $3 worth of fertilizer to establish a new lawn, too many grassland farmers spare the lime and fertilizer and pour on the seed when less seed and more nutrients are called for.

ONE YEAR CONTINUING INDEX

BEEF CATTLE

Profit on 10c Beef .....May 1955
Modern Beef Steer .....June 1955
Top Beef Steer .....June 1955
Menace of Showring .....June 1955
Small Scale Feeder .....Aug. 1955
Hybrid Beef Cows .....Aug. 1955
The Senepol .....Oct. 1955
Feeder Prospects for Profits Oct. 1955
New Kind of Cowman .....Nov. 1955
Performance Records Pay ..Nov. 1955
How Many Cows? .....Nov. 1955
Dobson's Meat Factory .....Dec. 1955
Spotting Borderline Cow ....Dec. 1955
Increase Income from Beef ..Dec. 1955
Yardstick for Beef Cattle ....Jan. 1956
Production Testing .....Feb. 1956
Beef Brucellosis Problem ..March 1956
Man Feeds 2500 Steers ....March 1956
Herd Bull Quarters .....April 1956
Performance Testing .....April 1956

CONSERVATION

Water, Lifeblood .....June 1955
Stubble Mulch .....Oct. 1955
Terraces Nuisance, Profitable Oct. 1955
Rain Slim, Cattle Fat .....Oct. 1955
Teamwork in Conservation ..Nov. 1955
He Rebuilt Circle G Ranch ..Dec. 1955
Mulch Mat Stops Erosion ....Jan. 1956
Dryland to Rangeland .....Jan. 1956
Work Shoulder to Shoulder Feb. 1956

CROPS

Coming, Hybrid Sorghums ..Aug. 1955
Sesame—New Crop .....Nov. 1955
Rice and Irrigation .....Nov. 1955
$10,000,000 Mushroom Industry Jan. '56
304 Bushels of Corn .....Jan. 1956
New Corn Planting Method ..Feb. 1956
Sunflower Program .....March 1956
Band Seeding Pays .....March 1956
Throw Away Rotations? ...March 1956

DAIRY CATTLE

Keys to Modernization ....June 1955
Understand Disinfectants ...June 1955
Cut Milk Costs in Half .....June 1955
Smokey Bear Sells Milk ....Aug. 1955
Certify Your Dairy Farm ...Aug. 1955
Hay Counts .....Aug. 1955
Frozen Semen .....Oct. 1955
Calf Scoring System .....Oct. 1955
Economy of Milk Replacers ..Oct. 1955
Marketing Cattle .....Nov. 1955
Frozen Semen .....Nov. 1955
New Ideas in Calf Raising ...Dec. 1955
One Bull, 100,000 Calves ....Dec. 1955
Get Rid of Mastitis .....Dec. 1955
Can I Afford A Bulk Tank? ..Dec. 1955
When to Sell Veal Calves ....Jan. 1956
New Protective Milk .....Jan. 1956
Report Pipeline Milking ....Feb. 1956
Emphasize Type? .....March 1956
Cull Dairy Cows .....March 1956
Bulk Tanks Need Care .....April 1956
Milk Per Acre .....April 1956
"Battling" Bossy .....April 1956

FARM BUILDINGS & SHOP WORK

Modern Farm Shop .....May 1955
Buildings Pay for Selves ....Nov. 1955
Roofing Farm Buildings ....Dec. 1955
Plastic Bag Silos .....Dec. 1955
Pumps Above Ground .....Feb. 1956

FARM MANAGEMENT

Financing Farm Business ...June 1955
Land Prices Up .....June 1955
Cut Corners in Chores .....June 1955
Future of Farming .....Aug. 1955
Partnership Farming .....Aug. 1955
Make Enough Profit .....Aug. 1955
Satisfied With Your Income? Oct. 1955
Commodity Market .....Oct. 1955
Man With Green Thumb ....Nov. 1955
Solving Trespassing Problem Nov. 1955
How 3 Families Did It .....Nov. 1955
Rural Revolt .....Nov. 1955
Process and Sell Direct .....Dec. 1955
Found His Fortune At Home Dec. 1955
Insure Farm Earnings .....Dec. 1955
Livestock Marketing .....Jan. 1956
Social Security for Farmers ..Jan. 1956
Ladder to Ownership .....Feb. 1956
Appraise A Ranch .....Feb. 1956
Livestock Marketing .....Feb. 1956
What Farm Managers Think of Soil Bank .....Feb. 1956
Parity, What You Make It March 1956
Your Lease A Lemon? ....March 1956
Too Much of Everything ...April 1956
Plan Your Estate Taxes ....April 1956
New Tax Depreciation .....April 1956
How to Appraise a Farm ...April 1956
Ease Thru the Squeeze .....April 1956

FARM EQUIPMENT & MACHINERY

Big Machinery Makers .....Aug. 1955
Cut Machinery Costs .....Aug. 1955
No Work Feeding .....Aug. 1955
Agricultural Aviation .....Aug. 1955
Grain Drier Pays .....Oct. 1955
Buy Used Machinery .....Oct. 1955
More Meat, More Feed .....Oct. 1955
High, Low Vacuum Milking Nov. 1955
Self-Feed Water, Too .....Jan. 1956
Engineering Ideas for Farm Feb. 1956
No Shovel Feeding .....Feb. 1956
Mechanized Feed Box ....March 1956

FEEDS

Liberal vs. Limited Feeding Nov. 1955
More Ways Use Electricity ..Dec. 1955
Feeding Dairy Herd .....Jan. 1956

FERTILIZERS

Why Lime? .....June 1955
Fertilize to Match Moisture June 1955
Fertilize Cover Crop .....Aug. 1955
Read Fertilizer Label .....Nov. 1955
Nitrogen Fertilizers & Grass Jan. 1956
Lime Pays and Pays .....Jan. 1956
Plant Growth Regulator ....Jan. 1956
How Much Fertilizer? ....March 1956
More for Fertilizer Dollar ..April 1956

FORESTRY

Trees A Crop .....Oct. 1955
Cutting Woodlands .....Nov. 1955
Timber Sales Agreements ...Dec. 1955
Good Lumber Piling .....Jan. 1956
Save Every Woodlot Stick March 1956
Money from Trees .....April 1956

ONE YEAR CONTINUING INDEX

FRUIT

Exotic Fruits .....June 1955
Dwarf Apples Grow-Up .....Aug. 1955
Semi-Dwarf Trees .....Dec. 1955
Long Pruning Ups Yields ....Jan. 1956
G.I. Joe Makes Grapes Grow Jan. 1956
All-Purpose Spray .....Feb. 1956
Dynamite Treat Strawberries Feb. 1956
Mulching Small Fruits ....March 1956

HAY AND HAY CROPS

Seed Mixtures .....Aug. 1955
Good Meadows .....Aug. 1955
Make Better Alfalfa Hay ....Nov. 1955
Forage Crushers .....Feb. 1956
Cut Hay Earlier .....March 1956
Long-Lived Alfalfa .....April 1956

HOGS

Test for Hog Efficiency ....June 1955
Sows Separate System .....Aug. 1955
Chester Whites Gross $12,000 Oct. 1955
Reproductive Gilts .....Oct. 1955
Latest Hog Breeding .....Oct. 1955
3 Litters in 15 Months .....Oct. 1955
More Health Certified Hogs ..Oct. 1955
Alfalfa Pays in Pork .....Nov. 1955
Raise Fast Gaining Boars ..Nov. 1955
Progress of Swine Inbreds ..Dec. 1955
Alfalfa Improves Sows .....Dec. 1955
Ahead in Hog Business .....Jan. 1956
Electric Brooders Save Pigs Feb. 1956
Hybrid Hogs .....Feb. 1956
New Model Pig .....Feb. 1956
Farrowing Management ...March 1956
Hog Farm Grosses $250,000 April 1956
Wean Pigs in 3 Weeks? ....April 1956
Planned Hog Program .....April 1956

IRRIGATION

Water at Seabrook .....June 1955
Sprinkler Erosion .....June 1955
Irrigate When Soil Tells You Aug. 1955
Fertilizing Thru Irrigation ..Oct. 1955
Fruit Trees & Water .....Nov. 1955
Why Farm Ponds Fail .....Feb. 1956
Irrigating Feed Crop .....March 1956
Water—Got Enough? .....April 1956

INSECTS AND INSECTICIDES

Kill Flies in Dairy Barn ....Aug. 1955
Control Household Insects ..Oct. 1955
Control Insects .....Feb. 1956
Progress Insect Battle ....March 1956

PASTURES

Seed for Grasslands .....June 1955
Zero Grazing .....Aug. 1955
Stretch Pasture .....Aug. 1955
Five Year Pasture Plan ....Dec. 1955
Range Rejuvenation .....Feb. 1956
Don't Lose Ladino .....Feb. 1956
Grassland for Dairymen ...March 1956
Plants Tell to Graze, Mow ..April 1956
Haul Pastures to Cows .....April 1956

POULTRY

New Poultry Housing .....Aug. 1955
Profitable Roasters .....Aug. 1955
Turkey Hatching Year Round Oct. 1955
Cut Broiler Costs .....Oct. 1955
Caponettes in the Woods ....Oct. 1955
Turkey Barbecues .....Nov. 1955
Certified Eggs .....Nov. 1955
Reducing Poultry Mortality Dec. 1955
Lighting Poultry .....Dec. 1955
Cleaning Eggs .....Jan. 1956
150 Eggs Per Turkey Hen ..Jan. 1956
$2,000,000,000 Bird .....Jan. 1956
Cull or Not to Cull .....Feb. 1956
10,000 Hens, One Man .....Feb. 1956
Egg Production Standards March 1956
Who Rules Roost? .....April 1956
Caged Layers .....April 1956

SHEEP AND GOATS

Self-Feed Phenothiazine ....June 1955
Go Easy with Hormones ....Aug. 1955
How To Feed Sheep .....Aug. 1955
More Lamb Gains, Less Feed Oct. 1955
Caring for Sheep Flock ....Dec. 1955
Good Sheep Management ....Jan. 1956
Two Ways to Feed Lambs ..Jan. 1956
Lamb Pool .....Feb. 1956
Sheep Improvement Program April 1956

SILAGE

Grass Silage with Bisulfite ..June 1955
Build A Bunker Silo .....June 1955
New Silage Preservative ....Aug. 1955
Causes of Poor Silage .....Oct. 1955
Self-Feed Silage to Cattle ...Dec. 1955
Plastic Silos .....April 1956

SOILS

Subsoiling, When It Pays ...Oct. 1955
Mysterious Molybdenum ....Dec. 1955
Work Soil Too Much? ....March 1956

VETERINARY

No Foot! No Milk .....June 1955
What About Twin Calves ....Aug. 1955
Erysipelas in Pigs .....Aug. 1955
Antibiotics for Calves .....Oct. 1955
Check for "Hardware" .....Nov. 1955
Vibriosis in Cattle .....Jan. 1956
Cattle Grub Control .....Jan. 1956
Feed Milk Fever, Ketosis ..Jan. 1956
Magnetize Cows, Stop Hardware .....Feb. 1956
Artificial Breed'g Research March 1956
Plotting Against Screwworm April 1956

WEEDS

New Weed Killers .....May 1956
Weed Herbicides .....March 1956

MISCELLANEOUS

How To Keep a Farm Wife June 1955
Student Exchange .....Aug. 1955
Foreign Farm Youths .....Oct. 1955
Don't Trust to Luck .....Nov. 1955
Who Is the County Agent? ..Nov. 1955
Valley Farm .....Nov. 1955
Science and Farm .....Nov. 1955
Verona's Farm Fair .....Dec. 1955
U.S. Stock to Foreign Pastures Jan. '56
Outstanding Young Farmer Jan. 1956
IFYE Spreads Goodwill ....March 1956
Australia Agriculture .....March 1956
Fast Fire Protection .....March 1956
Rodent Control .....March 1956
Visitors Discover U.S.A. ....April 1956
Soviet Drive for Wheat, Feed Apr. 1956
Story of Donald Sanford ...April 1956

Best Farm Books For Your Library

Select titles you need and order from these pages.

A good farm book can substitute for a lot of unhappy farming experience and cost you a great deal less in time and money.

ORDER BOOKS DIRECT FROM THESE PUBLISHERS—Identifying numbers at left appear also in book title descriptions to tell source of each book. Send $.15 per book to cover postage.

(1) Devin-Adair Co., 23 E. 26th St., New York 10, N. Y.
(2) College Science Publishers, P.O. Box 798, State College, Pa.
(3) Iowa State College Press, Press Building, Ames, Iowa.
(4) Farmer's Digest, Box 404, Fort Atkinson, Wisconsin.
(5) Springer Publishing Co., 44 E. 23rd St., New York 10, N. Y.
(6) John Wiley & Sons, Inc., 440 Fourth Ave., New York 16.
(7) Ronald Press Co., 15 E. 26th St., New York 10, N. Y.

ARTIFICIAL BREEDING

Artificial Breeding of Farm Animals. Perry. 1952 Edition. (Source 4) $5.00

BEEF CATTLE

Beef Cattle. 4th Edition. R. R. Snapp. 641 pages. 1952. (Source 6) $6.50

DAIRY CATTLE AND DAIRYING

Dairy Cattle. 1955 4th Edition. W. W. Yapp and W. B. Nevens. U. of Illinois. 420 p. (Source 6) $4.75
Fitting and Showing Dairy Cattle. 112 p. 1952. (Source 3) $2.00
Dairy Cattle Feeding and Mgt., Henderson-Reaves. 1954. (Source 6) $6.50

FARM CROPS

Hunger Signs in Crops. Color photos. Practical. (Source 4) $4.50
Crop Production, Principles and Practices. Ahlgren. 1953. (Source 4) $4.50
Plant Regulators in Agriculture. Turkop. 1954. (Source 6) $5.50

LAW AND THE FARMER — By J. H. Beuscher. How law affects every situation of farm life and farm business. What you must do to carry out your plans without inviting legal troubles. Everything from farm purchase and farm lease to death taxes, farm debts, boundaries and water rights. 416 pages. Send only $4.95

LIVESTOCK HEALTH ENCYCLOPEDIA — Edited by R. Seiden. How to improve the health of your cattle, sheep, hogs, other livestock. Which remedies to use, for best results at lowest cost, in prevention and treatment of diseases, parasites, common injuries. In easy ABC order. 624 pages, 300 illustrations. Send only $7.50

TRIAL ORDER. Within ten days you may return book(s) for full refund.

Springer Publishing Company, Inc.
44 E. 23rd St. New York 10, N.Y.

GRASSES AND LEGUMES

Range Management. Sampson. 1952. (Source 6) $7.50
Forages: The Science of Grassland Agriculture. Hughes. 724 p. (Source 3) $5.95

POULTRY

Economics of Poultry Mgt. Botsford. 1952. (Source 6) $5.75
Hatchery Operation and Mgt. Funk-Irwin. 1955. (Source 6) $6.50
Commercial Poultry Production. Marble and Jeffrey. (Source 7) $6.00

FARM & ACCOUNTING MGT.

Farm Records and Accounting. Hopkins and Heady. (Source 3) ...$4.50
How to Make Your Farm Pay. Malone. 1951. 371 p. (Source 3) $3.95
Law and the Farmer. Beuscher. 1955. (Source 5) $4.95

FEEDS

Feeds & Feeding. Complete. Morrison. 1951. 1200 p. (Source 4) $7.00
Feeds and Feeding. Abridged. Morrison. 1951. 631 p. (Source 4) $3.50

GENERAL FARMING

Midwest Farm Handbook, 400 p. 1954. (Source 3) $3.00
Grasses and Grassland Farming. Hi Staten. 336 p. (Source 1) $5.00

GENERAL LIVESTOCK

Animal Breeding. Winters. 1954. (Source 6) $5.75

MARKETING

Profitable Roadside Marketing. Donaldson, Johnstone. 1956. (Source 2) $2.00

SHEEP

Sheep Science. Kammlade. 1947. 534 p. (Source 4) $6.00

TREES AND FORESTRY

Improved Nut Trees of North America and How to Grow Them. Reed & Davidson. (Source 1) $6.00

VETERINARY

Livestock Health Encyclopedia. Selden. 624 p. 300 Illus. 1951. (Source 5) $7.50

This listing of farm books is a service to our readers and to publishers. For information about costs, write to Farmer's Digest, Fort Atkinson, Wisconsin.

FARM SUPPLIES, SERVICES

Subscribe now to Yorkshire Journal, learn about fastest growing breed of "meat-type" hogs, $1 per year. Write:

American Yorkshire Club
Lafayette, Indiana

LAWN MOWERS, FARM
Wind King 9lectric Mfg. Co., Merrill, Iowa. Write for catalogs.

FARM MANAGEMENT
Doane Agricultural Service, St. Louis 8, Missouri.

FARM SEEDS
J. W. Jung Seed Co., Randolph, Wisconsin. Seed catalog.

HOME FLOUR MILL
Lee Engineering Co., Dept. F.D., 2023 W. Wisconsin, Milwaukee 3, Wis. Stone grind your own flour.

$1000. MONTHLY POSSIBLE, raising Fishworms, Large African Nightcrawlers, backyard, garage, basement. Illustrated Booklet explains raising, packing, marketing. 25c. Ozark Worm Farm-30, Willow Springs, Missouri.

Farmer's Digest Can Sell For You
Our magazine is an unusual one, offering an unusual opportunity if you have a special product or service to sell. We reach farmers who obviously want to read. You reach them, too, with even a small ad in Farmer's Digest. Write Box 404, Fort Atkinson, Wisconsin, for rates and information.

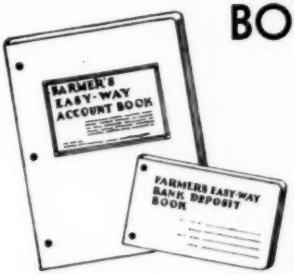
EXTRA CASH for Salesmen—Housewives-Farmers selling Scotchlite signs. They shine at nite for top of mail boxes—also house numbers—Door plates. Quick Sales—Big profit—Ideal for retired persons on pensions—Free Sales Outfit—Illuminated Sign Co., 2942 1st Ave. S., Minneapolis, Minnesota.

VETERINARY PRODUCTS
Anchor Serum Co., of Indiana, Indianapolis, Indiana. Veterinary Catalog.

NOWASTE Mineral Feeders for hogs, cattle, sheep. Pen and sow feeders. Pellet feeders. Weatherproof Poultry range feeders. Composters. FERTUSAN Compost activator and Poultry land cleaner. Soil test kits. Write —

Otto Zimmerman, Mfr., Dept. F.D., Fairfax, Minnesota

LET YOUR BANK KEEP YOUR FARM BOOKS



Here's a new idea that lets you do your farm record keeping when you "darn well" feel like it. It gets you away from being a bookkeeper everyday of the year . . . yet accurately records information you must have to make money farming and avoid paying taxes you don't owe.

Secret of the new system — "It lets your bank keep your books." It provides a special farm bank deposit or pass book that you can substitute for the bank book you now use. In this new bank book, you or the teller have ample space to record where your deposits come from and what you sell. At the end of the year, a complete record of your farm income is ready to transfer to your Easy-Way Account Book.

It's even easier to keep a definite and indisputable record of your farm expenses as you go through the year. Just do what you should do anyway . . . pay by check. Note on the check or the stub what you bought or paid for. Later transfer this information to the Expense Summary of your Easy Way Account Book. Again, you automatically get the figures required for your income tax return.

There's nothing else like the Easy-Way System. One farm family, using a similar system, figured time spent paid them $25.00 an hour. Order your Easy-Way System today. Your money back if you aren't completely satisfied. Send only $2.00 to the address below.

FARMER'S DIGEST
Fort Atkinson, Wisconsin

A Farm Manager's Report Shows

What Really Happened To Farm Income In 1955

The 1955 slide in farm income doesn't mean a great deal quoted in billions of dollars. To bring it "home", use the kind of figures Ed Malcheski quotes from his 30 family-owned farms in Iowa County, Wisconsin.

A fieldman for the Iowa County Efficient Farming Association, Malcheski found that average farm labor income fell from $4,465 in 1954 to only $1,701 in 1955. He charges $1,584 of this slide to hog prices and $1,068 to drouth which decreased feed inventories. Figures look like this:

Income	1954	1955
Milk	$ 8,849	$ 9,255
Pork	5,060	3,476
Cattle	1,736	1,813
Mis'laneous Cash	795	630
Increased feed inventory	763	none
Poultry	381	394
Total Income	$17,584	$15,568

Expenses	1954	1955
Cash Expenses	$ 8,145	$ 7,810
Mach. depreciation	1,222	1,323
Bldg. depreciation	641	653
Interest on investment	2,611	2,583
Decreased feed inventory	none	1,068
Unpaid labor	500	430
Total Expenses	$13,119	$13,867
Labor Income	$ 4,465	$ 1,701

Labor income is figured to be actual pay for the farm operator . . . what is left after paying all cash expenses, adjusting changes in inventories, value of unpaid family labor, and deducting 5% interest on the farm investment.

The six best farms averaged $3,942 labor income as compared to $8,842 in 1954. Operators of the low six farms actually showed a minus labor income, received nothing for their time and management, and earned only 3% on their farm investment.

Income from milk, cattle and poultry increased $496 during 1955. The average farmer added the equivalent of .7 of a cow during the year and increased milk production 116 lbs. Had dairy income not increased, average income would have been further reduced $322. In most cases it's easier to increase production, Malcheski says, than try to reduce fixed costs.

Malcheski's farms are growing. They remain family farms, but in the last 3 years, 4 have purchased more land, 11 are renting more land, and 6 are eager to buy more land.

1956 prospects in Iowa County are brighter. Recent increase in manufactured and fluid milk prices will add substantially to dairy income. We don't know how many hogs Malcheski's farms sold below $12.00 in 1954, but Chicago hogs are now back to $16.00. If expenses stay in line, additional income may make a brighter picture.